BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 15 1947

THE "COSTOCLAVICULAR SYNDROME"

BY

E. D. TELFORD, F.R.C.S.

Emeritus Professor of Surgery, University of Manchester

AND

S. MOTTERSHEAD, M.D., F.R.C.S.

Assistant Lecturer, Department of Anatomy, University of Manchester

While the symptoms which may arise from pressure on the neurovascular bundle as it passes from the thoracic inlet to the arm, although many and varied, are well known and easily recognizable, there is no general agreement on either the site or the mechanics of the compression. There is no doubt that earlier writings have over-simplified the position, and only in recent years does it seem to have been realized that there is no one cause of pressure common to all cases.

The present study is based on: (1) the findings at 120 operations undertaken for the relief of pressure on the neurovascular bundle of the arm; (2) examination of the effects of posture of the shoulder girdle on the radial pulse in a series of 120 medical students; (3) the evidence obtained by dissection of 30 bodies.

Operation Findings

These are based on the records of 120 patients who were operated upon by one of us (E. D. T.) between 1908 and the present time for symptoms of pressure on the neurovascular bundle of the arm. Of the 120 cases there were 16 in which the customary symptoms were accompanied, and to a great extent overshadowed, by complications. The remaining 104 cases were of the ordinary textbook type.

The Complicated Cases

Fourteen of these showed extensive arterial thrombosis, and in the other two the outstanding complaint was a profuse hyperhidrosis of the hands. In all the cases of thrombosis a well-developed cervical rib was present, but in no single case was any deformity, narrowing, or periarteritis found in the artery where it lay on the rib. In 12 patients the thrombosis extended no higher than to some point between the bifurcation of the brachial artery and the lower border of the pectoralis major. In only two cases was the thrombosis found to extend upwards towards the cervical rib. In neither of these did it reach the rib, but began 1 cm. distal to it in an aneurysmal dilatation of the vessel with much periarteritis.

In two patients the hyperhidrosis of the hands was profuse enough to prevent them following their employment. In one of these the cause was a well-formed cervical rib, and in the other a taut fibro-cartilaginous band representing the forward end of a rudimentary cervical rib.

The Uncomplicated Cases

In 12 of the 104 cases pressure on the lowest trunk of the plexus was due to a strong taut band springing from the pointed tip of a small cervical rib. This band passes downwards and forwards in the anterior border of the scalenus medius. If the anaesthetist is asked to deepen the breathing the lowest trunk is seen to be lifted up by the band; it has in fact in most cases a permanent notch at the point of contact.

A condition which was very similar was found in another 8 cases. The insertion of the scalenus medius was carried forward further than normal, with the result that the lowest trunk and the artery were not in contact with the rib but were raised by the V formed on one side by the lateral tendinous edge of the scalenus anterior and on the other by the sharp anterior border of the scalenus medius. In all these cases a partial detachment of both muscles resulted in cure. In 2 cases, both girls aged 14, the cause of pressure was a large cancellous boss arising at the point where a well-developed cervical rib reached the first thoracic rib. In 8 patients resection of an apparently normal first thoracic rib cured the trouble. In two at least of these there was a distinct scoliosis of the cervico-dorsal spine. In 5 patients no adequate cause was found. They were unrelieved by operation, and may have been instances of "brachial neuritis" or of "prolapsed disk."

The remaining 69 cases showed "cervical" ribs in various stages of development. In none of these cases save 3 was there any naked-eye evidence that either plexus or artery had been damaged by pressure of the clavicle. In the majority the lowest trunk, when freed, showed a permanent notch made by the upper edge of the rib, across which it had been tightly stretched. In 3 cases there was an aneurysmal dilatation of the third stage of the subclavian artery starting 1 cm. distal to the rib. With two such cases already mentioned, this gives 5 cases of dilatation in 120 patients—a proportion which is in close accord with Halsted's (1916) report of 25 instances in 525 patients.

Previous writers have stated that these "cervical" ribs are in some patients true first thoracic ribs in a deformed and rudimentary state. This observation can be confirmed by taking antero-posterior skiagrams by the moving mandible technique. This permits an accurate count of the cervical vertebrae, and should be done in all cases of suspected cervical rib.

Constriction of Axillary Artery by the Median Nerve

A young man aged 23 complained that when his left arm was hanging down by the side he felt numbness and tingling in the hand. This not only gave him much trouble at his work but had led to his being invalided out of the Army. It was noted that depression of the shoulder obliterated the radial pulse but left the third stage of the subclavian artery unaffected.

At operation no cause was found in the neighbourhood of the first rib. A second incision was made below the clavicle through which the axillary artery and adjacent nerves were freely exposed. It was then seen that on downward traction of the arm the artery was compressed by the grip of the two heads of the median nerve and that all pulsation ceased below this point. The opportunity of two incisions, one above and one below the clavicle, was taken to determine what pressure the clavicle could exert on the first rib. A piece of drainage tubing of a calibre equal to that of the artery was threaded between the wounds and behind the clavicle parallel to and in front of the vessel, with the shoulder in the normal position. On depression of the shoulder the tube fell out because the

clavicle moved away from the rib. In this patient, a broad-shouldered well-built man, there could be no possibility of pressure on the neurovascular bundle in depression of the shoulder.

From the above findings in 120 interventions it is clear that no one happening—e.g., clavicular pressure—can explain all cases of pressure lesions of the plexus.

Movements of the Shoulder in Relation to the Radial Pulse

It is an old observation that in certain positions of the shoulder the radial pulse is diminished or completely arrested. Some writers have taken for granted that the cause of this interference is costoclavicular pressure. For instance, Falconer and Weddell (1943) state that "more than one postural manœuvre involving the shoulder girdle may result in compression of the subclavian vessels." But it is not the subclavian artery that is compressed. A simple observation will show that there is a normal pulse in the first stage of the axillary artery well below the clavicle and that the clavicle has nothing to do with the arrest of the pulse in the arm on pure depression of the shoulder. From this point of view we examined a large series of medical students.

In the extensive literature of cervical rib difficulties arise from a lack of exact definition of the position of the arm and shoulder. In what follows we mean by "depression" a position of the arm held vertically by the side in the posture of carrying a heavy bag, and by "retraction" we imply a displacement of the shoulder backwards, a bracing back of the shoulder as in "throwing a chest." The results are set out in the accompanying Table. From this it is

Table Showing the Effect of Different Postures of the Shoulder in 240 Arms with the Subject in the Erect Position

	Depression of Shoulder	Retraction (Bracing Back) of Shoulder	Extension of Neck (Adson's Manœuvre)	Abduction of Arm		Adduction of Arm Against Resistance
				90°	180°	
70 males (i.e., 140 arms):						
No effect on radial pulse	56	53	118	131	75	18
Radial pulse diminished	68	70	20	6	42	38
Radial pulse obliterated	16	17	2	3	23	84
50 females (i.e., 100 arms):						
No effect on radial pulse	30	23	94	91	35	9
Radial pulse diminished	48	64	6	6	35	16
Radial pulse obliterated	22	13	0	3	30	75

seen that in depression of the shoulder there were 116 instances of diminution and 38 of arrest of the radial pulse—i.e., the radial pulse showed some alteration in 64%. In retraction of the shoulder there were 134 instances of diminished and 30 of arrested pulse—i.e., the radial pulse was modified in 68%. In abduction of the arm to 90° the effect is but slight; in only 18 cases—i.e., 7.5%—was any difference noted. In abduction to 180° the proportion of cases in which some alteration was found rose to 54%.

The results when the subject attempts adduction against resistance are of special interest. Whereas in passive abduction to 90° the percentage of alteration is as low as 7.5, when the arm is actively adducted there is a steep rise to 90%. This seems to indicate that some muscular action has come into play. The subject will be referred to later. If the same observations are made with the subjects recumbent it is found that there is no difference in the results from depression of the shoulder in the erect and recumbent positions. This finding suggests that the cause is purely mechanical and unaffected by gravity. In the recumbent position the effects on the pulse in abduction to 180° are noticeably slighter. This may be due to the effect of gravity.

Anatomy of the Axillary Artery

Bearing in mind the fact that the arrest of the pulse is in the axillary artery this region was dissected in 18 bodies. In 12 out of 18 dissections the axillary artery at the level of the second rib took an abrupt lateral turn for 1.5 cm. and then again changed direction to pass directly down into the arm. The trunks of the plexus were arranged round the first part of the artery in the following manner: the superior trunk was placed postero-lateral, the middle trunk posterior, and the inferior trunk postero-medial to the vessel. The lateral and medial heads of the median nerve were given off the plexus just at the point where the artery made its S turn opposite the second rib. They lay one in front and the other behind the artery, embracing it in a scissor-like grip which when the shoulder was depressed by traction on the arm could be seen to constrict the vessel. In the remaining 6 subjects the lateral curve of the vessel occurred opposite the first rib. Thus the superior trunk lay anteriorly, the middle trunk postero-medially, and the inferior trunk medially to the artery. The two heads of the median nerve are, in this type, so disposed that they cannot constrict the vessel however much the shoulder is depressed.

The above relationships differ from those usually described owing to the fact that our dissections were made with the arm close alongside the trunk. In the usual position for dissection—i.e., abduction to 90°—the S bend of the vessel is straightened out. The heads of the median nerve are in relation to the third part of the artery when the arm is abducted but to the junction of the first and second parts when the arm is by the side of the body.

The evidence afforded by the operation described above and by observations from our dissections would seem to suggest that the arrest of the radial pulse in depression of the shoulder is due to compression of the artery by the heads of the median nerve. It is not without significance that these postures caused changes in the pulse in two-thirds of the students and that a relationship in which such constriction was mechanically possible was found in 12 of 18 bodies.

The explanation of the arrest of the radial pulse in abduction is not easy. Dissection shows that with the arm alongside the body the neurovascular bundle lies at a distance of 3 to 4 cm. below the coracoid process. As the arm is abducted the distance alters little, for although the bundle rises slightly the coracoid is elevated at its tip and moves backwards owing to rotation of the scapula. This movement carries the pectoralis minor upwards and backwards so that the neurovascular bundle is obliged to move slightly backwards under this muscle to reach the abducted arm. During abduction the humerus rotates laterally to prevent the impingement of the greater tuberosity against the acromion. The humeral head protrudes into the lax part of the joint capsule, causing a prominence under the tendon of the subscapularis. The neurovascular bundle as it emerges from under the pectoralis minor is pressed against the head of the humerus covered by the tendon of the subscapularis. Division of the pectoralis minor at its insertion frees the bundle, and its close apposition to the humerus is relieved.

It has already been shown that, whereas simple abduction of the arm to 90° interferes with the radial pulse in 7.5% of subjects, the ratio rises at once to 90% if the subject forcibly adducts the arm. By this action the pectoralis minor and subscapularis would be tautened to an extent sufficient to cause compression of the axillary artery. Whilst making this suggestion with reserve we would state definitely that in none of our dissections did we find any

evidence to support Wright's (1945) contention that trouble may arise from forcible contact with the coracoid process itself.

Movements of the Clavicle in Relation to the First Thoracic Rib

The relations between the clavicle and the first rib were studied in 25 bodies. In these formalinized bodies it is necessary to cut across a certain amount of muscle if full movement of the clavicle is to be obtained. To guard against the possibility that this cutting of muscle might falsify the findings, five fresh post-rigor bodies were examined in the post-mortem room. There was, however, no difference in the findings in the two sets of bodies.

When the shoulder girdle is depressed by pulling the arm downwards alongside the trunk the clavicle describes an arc moving downwards and forwards so that the further the shoulder is depressed the further forward the clavicle moves, widening the interval between the clavicle and the rib. At no point in this excursion could the clavicle be made to impinge on the subclavian artery, but the interval between the two bones is narrowest (1.5 cm.) when the clavicle lies opposite the upper border of the first rib. In order to press the clavicle directly backwards on the first rib it is necessary to open the sternoclavicular joint and to sever the intra-articular disk.

As regards the plexus itself depression of the shoulder causes the superior and middle trunks, together with the contribution from the seventh cervical nerve to the long thoracic nerve (nerve to the serratus anterior), to be tightly stretched across the tendinous edge of the scalenus medius. The inferior trunk is pulled hard down into the angle of junction of the scalenus medius and the first rib. It is not possible by this manœuvre to compress the artery against either of the scaleni. The vessel can still be moved freely from side to side in the interval between the scaleni, but the S curve is abolished.

When the shoulders are retracted the acromial end of the clavicle rises and the bone lies across the root of the neck above the level of the first rib. The clavicle now makes an angle of 30° with the first costal cartilage. In this position the tendon of the subclavius compresses the subclavian vein against the first rib, but the clavicle itself does not press on that vessel. The middle third of the clavicle pushes the neurovascular bundle backwards against the anterior border of the scalenus medius, and in the presence of a resistance—e.g., a cervical rib or an abnormally placed first rib—could compress the bundle.

The excursion of the clavicle in abduction shows little or no difference from that already described in retraction.

Discussion

The literature of brachial plexus pressure has increased considerably in recent years. This is due in part to the striking rise in the number of cases of paraesthesia of the hand and arm in middle-aged women who are overworked, underfed, and spend much time carrying shopping baskets. The general tendency is to suggest that the troubles are due to compression of the plexus between clavicle and first rib. This is a pure supposition unsupported by any anatomical evidence. Some confusion in the literature further arises from papers which base definite opinions on an insufficient number of cases or include abnormal types—e.g., scoliotics. Moreover, not enough attention has been paid to a separate analysis of the movements of depression, retraction, and abduction.

In a normal person standing in the erect position the clavicle is presumably not pressing on the bundle. The moment that pure depression of the shoulder begins the clavicle moves away from the bundle, and the further the depression the further is the clavicle away. It seems clear, therefore, that symptoms referable to the plexus arising in depression of the shoulder are not due to pressure by the clavicle, and we believe that they are caused purely by drag on the nerve cords. In this position of the limb we have shown that the plexus is stretched taut over the edge of the scalenus medius, and this is especially likely to happen where that muscle has its attachment carried forward further than usual on the first rib.

It is otherwise with retraction and with abduction. Here the clavicle in its middle third presses the neurovascular bundle against the scalenus medius. With a normal muscle such pressure is trivial; it possibly explains those cases where prolonged abduction of the arm, as in dressing the hair, causes temporary "pins and needles." Should, however, the resistance be stiffened by a cervical rib or an abnormally high first rib the pressure might easily become more serious.

It seems likely that the patients may be divided into two groups. In one, the smaller group, the pressure is clavicular, and in this type the symptoms are those of the whole plexus pressure. They are produced by retraction and abduction, and are felt at places from the deltoid region down to the hand. In the second group the symptoms are referable predominantly to the distribution of the lowest trunk and are due to hanging up of the plexus over a cervical rib, a band, the scalenus medius, or an abnormal first rib when the shoulder is depressed. We believe this to be much the larger group.

Summary

An account is given of the findings in 120 operations and 30 dissections, with observations on 120 students.

No one mechanical cause can explain all cases. Damage by pressure of the clavicle cannot happen in pure depression of the shoulder, but is a likely event in retraction and abduction if cervical rib or abnormal first rib be present. These cases will probably show whole plexus symptoms.

The most common cause of symptoms is the hanging up of the plexus on a cervical rib or other mechanical obstacle. These cases are likely to show lowest trunk symptoms.

The phenomenon of alteration in the radial pulse on movements of the shoulder is due to causes distal to the clavicle. It has nothing to do with the costoclavicular syndrome.

We desire to express our indebtedness to members of the anatomy staff, and especially to Drs. E. L. Patterson and T. E. Barlow, for their help in this inquiry.

BIBLIOGRAPHY

Adson, A. W., and Coffey, J. R. (1927). *Ann. Surg.*, **85**, 839.
Bird, F. D., and Smith, J. (1910). *Austral. med. J.*, **15**, 343.
Blair, D. M., Davies, F., and McKissock, W. (1935). *Brit. J. Surg.*, **22**, 406.
Bramwell, E. (1903). *Rev. Neurol. Psychiat.*, **1**, 236.
—— and Dykes, H. B. (1921). *Edinb. med. J.*, **27**, 65.
Brickner, W. M. (1927). *Ann. Surg.*, **85**, 858.
Eden, K. C. (1939). *Brit. J. Surg.*, **27**, 111.
Edington, G. H. (1932). *Glasg. med. J.*, **118**, 289.
Falconer, M. A., and Weddell, G. (1943). *Lancet*, **2**, 539.
Halsted, W. S. (1916). *J. exp. Med.*, **24**, 271.
Hill, R. M. (1939). *Brit. J. Surg.*, **27**, 100.
Jones, F. Wood (1911). *J. Anat.*, Lond., **45**, 249.
—— (1913). *Proc. roy. Soc. Med.*, **6**, Clin. Sect., p. 95.
Lewis, T., and Pickering, G. W. (1934). *Clin. Sci.*, **1**, 327.
Morley, J. (1913). *Clin. J.*, **42**, 461.
Murphy, J. B. (1905). *Ann. Surg.*, **41**, 399.
Naffziger, H. C. (1937). *Surg. Gynec. Obstet.*, **64**, 119.
—— and Grant, W. T. (1938). Ibid., **67**, 722.
Newell, R. L. (1933). *British Medical Journal*, **1**, 782.
Ochsner, A., Gage, M., and De Bakey, M. (1935). *Amer. J. Surg.*, **28**, 669.
Paul, L. R. (1946). *Amer. Heart J.*, **32**, 32.
Sampson, J. J., Saunders, J. B., and Capp, C. S. (1940). Ibid., **19**, 292.
Sargent, P. (1921). *Brain*, **44**, 95.
—— (1913). *Proc. roy. Soc. Med.*, **6**, Clin. Sect., p. 117.
Scott, G. (1912). *British Medical Journal*, **2**, 483.
Stapley, W. (1912). *Proc. roy. Soc. Vict.*, **25**, 82.

Stopford, J. S. B., and Telford, E. D. (1919). *Brit. J. Surg.*, 7, 168.
—— —— (1931). Ibid., 18, 557.
Swank, R. L., and Simeone, F. A. (1944). *Arch. Neurol. Psychiat.*, 51, 432.
Telford, E. D. (1913). *Lancet*, 2, 1116.
—— (1942). *British Medical Journal*, 2, 96.
Thorburn, W. (1908). *Dreschfeld Mem. Vol.*, M/c. Univ. Pubs., No. 35, p. 85.
—— (1913). *Proc. roy. Soc. Med.*, 6, Clin. Sect., p. 113.
Todd, T. W. (1911). *J. Anat.*, Lond., 45, 293.
—— (1912a). Ibid., 46, 244.
—— (1912b). *Anat. Anz.*, 41, 257, 385.
—— (1913a). *Lancet*, 1, 1371.
—— (1913b). *J. nerv. ment. Dis.*, 40, 439.
—— (1913c). *J. Anat.*, Lond., 47, 250.
—— (1922). *Ann. Surg.*, 75, 105.
Le Vay, A. D. (1945). *Lancet*, 2, 164.
Walshe, F. M. R. (1945). *British Medical Journal*, 2, 596.
—— Jackson, Harvey, and Wyburn-Mason, R. (1944). *Brain*, 67, 141.
Wilson, S. A. K. (1913). *Proc. roy. Soc. Med.*, 6, Clin. Sect., p. 133.
Wright, I. S. (1945). *Amer. Heart J.*, 29, 1.

WATER AND SALT DEPLETION*

BY

H. L. MARRIOTT, C.B.E., M.D., F.R.C.P.

Physician with Charge of Out-patients, Middlesex Hospital

Comparison of Effects

The main differences are shown in Table V. Their theoretical explanation, as already suggested, appears to derive from the contrast in conditions of extracellular-fluid osmotic pressure. In pure water depletion (Fig. 4A) the extracellular fluid tends to become hypertonic and its volume to be maintained by withdrawal of water from the cells. In consequence of the relative normality of the plasma volume, oligaemic symptoms, such as lassitude, giddiness, fainting, and fall of blood pressure, are absent or do not develop until a late stage. Thirst is pronounced because of cellular desiccation. In pure salt depletion (Fig. 4B) the extracellular fluid tends to become hypotonic and so water is not sucked from the cells and there is little or no thirst. The kidneys, working to preserve isotonicity of the extracellular fluid, excrete water; therefore, while water is being ingested and absorbed, urine volume is not significantly decreased, and may be increased. The volume of the extracellular fluid falls. The decrease of plasma volume causes prominent symptoms of peripheral circulatory failure due to oligaemia and increase of blood viscosity.

TABLE V.—*Comparison of Effects of Water and Salt Depletion*

Manifestation	Pure Water Depletion	Pure Salt Depletion
Dehydration	+++ primary or simple	+++ secondary or extracellular
Thirst	+++	Absent
Lassitude	+	+++
Orthostatic fainting	Absent till late	+++
Urine volume	Scanty	Normal till late
NaCl in urine	Often +	Always absent except in Addison's disease
Vomiting	Absent	May be +++
Cramps	"	"
Plasma NaCl	Slight increase or normal	Diminished +++
Blood urea	+	+++
Plasma volume	Normal till late	Decreased +++
Haemoconcentration	Not till late and slight	+++
Blood viscosity	Normal till late	Increased +++
Blood pressure	" "	Fall +++
Water absorption	Rapid	Slow
Mode of death	? due to rise of osmotic pressure	Peripheral circulatory failure

Mixed Water and Salt Depletion

Pure water depletion may be defined as reduction below normal of total body water without significant reduction of total body salt; pure salt depletion, as reduction below normal of total body salt without reduction of body water beyond that which is inevitable from loss of extracellular osmotic pressure. Mixed water and salt depletion may be defined as reduction below normal of total body water and total body salt, the water reduction being greater than that consequent upon the secondary dehydration of salt depletion. This occurs in patients in whom there have been abnormal losses of secretions *without free intake of water*; the water loss tends to outstrip salt loss because the secretions lost are either isotonic (gastric or intestinal juices) or hypotonic (saliva, sweat), and, in addition, there is extra depletion of water in the continuous unavoidable losses, averaging about 1.5 litres daily, which occur from the skin and lungs and in the urine. Patients suffering from mixed depletion, as above defined (water loss in excess), have a mixture of the symptoms of pure water and of pure salt depletion. This is because the extracellular-fluid volume is diminished, due to the reduction in total sodium and chlorine, but there is also a tendency for the shrunken extracellular fluid to be hypertonic owing to the disproportionate water loss. The tendency to hypertonicity causes some withdrawal of water from the cells. The clinical picture, therefore, is such that patients show the circulatory and other features due to reduction of extracellular-fluid volume, but are also thirsty, have dry mouths, and have early oliguria.

Any condition causing secretion losses unaccompanied by adequate water intake will result in mixed depletion. Cases of acute vomiting provide the commonest examples. In protracted vomiting, such as occurs in pyloric stenosis, the effects of salt depletion tend to dominate the picture because water intake usually goes on until the late stages, so that there is a prolonged phase of selective drain of chlorine and sodium. Estimations of plasma concentrations of sodium and chlorine are even more fallacious as indicators of total loss of these ions in mixed depletion (water loss in excess) than in pure salt depletion, because of the tendency to hypertonicity in the diminished extracellular fluid. In any case, plasma chlorine estimations in vomiting, as already pointed out, are no guide to the concentration of sodium ions, because of the much greater loss of chlorine than of sodium (see Fig. 8). In mixed depletion due to vomiting it is possible for the concentration of sodium ions, largely partnered by HCO_3, and the plasma osmotic pressure to be raised when the concentration of chlorine ions is decreased. In severe diarrhoea without vomiting (see Fig. 8) the converse may be true. The concentration of chlorine ions may be a little lower, or normal, or even raised while the concentration of sodium ions is decreased. Rogers (1921) found serum chlorides in cases of cholera before treatment to be as high as 0.79%.

Occurrence of Pure and Mixed Depletions in Practice

Pure water depletion is frequent in the circumstances already described; pure salt depletion or mixed water and salt depletion, however, are still more common because of the many causes of vomiting and diarrhoea. It is necessary to enumerate only a few of these causes to realize the frequency with which water and salt may be lost from the body. For example, vomiting may occur from gastritis, gastro-enteritis, appendicitis, pyloric or intestinal obstruction, and peritonitis; associated with pregnancy, after administration of anaesthetics, in alcoholism, in uraemia, in diabetic ketosis, in sea-sickness; and in such intracranial conditions as concussion, meningitis, cerebral tumours, and cerebral vascular lesions. Diarrhoea may occur from enteritis and colitis, from dysentery and cholera, from pancreatic insufficiency, in sprue, from ulcerative and neoplastic conditions of the intestines, and in patients in whom

* Conclusion of the Croonian Lectures delivered at the Royal College of Physicians, London, on Dec. 3 and 5, 1946. Parts I and II appeared in our issues of Feb. 15 (p. 245) and March 8 (p. 285).

ileostomy has been performed (Cave, 1946). The special frequency of vomiting and diarrhoea in children is well known; their particular vulnerability to water and salt loss has already been mentioned.

The present frequency of pure salt depletion resulting from the treatment with water alone in those who have lost both salt and water has been emphasized. In recent months I have seen such unrecognized salt depletion in ten patients: two with severe gastro-enteritis, one with ulcerative colitis, two with chronic alcoholism, and in five after operation (gastrectomy, cholecystectomy, ileostomy, and two gastro-enterostomies). All ten had been diagnosed as suffering from dehydration. Four of the five post-operative cases had been treated with intermittent spells of gastro-duodenal suction drainage. All the patients had been on forced fluids, and intake and output charts were being kept. All had become extremely ill and were drowsy, apathetic, or stuporous. None complained of thirst, and *none had chloride in the urine.* All had lowered blood pressures; in three the systolic pressure was below 90 mm. Hg. The blood urea levels were raised, the highest being 280 mg. per 100 ml. After the diagnosis of salt depletion had been made, all, except one of the alcoholics, were treated by the administration of large amounts of intravenous saline (5 to 9 litres of isotonic saline) and all, except the untreated alcoholic and the ileostomy case (plasma Na 242 mg. %), rapidly recovered. In the Tropics I saw many instances of the salt-depletion syndrome, from simple sweating to sweating plus vomiting and diarrhoea, develop in patients suffering from various forms of medical and surgical illness.

The failure to recognize the true nature of the salt depletion syndrome often occurs because the patient's deterioration is explained in terms of pathological states which are essentially secondary but are mistakenly thought to be primary. Thus in many cases the frequent high blood urea levels lead to a diagnosis of uraemia. The tendency to vomiting in the late stages sometimes suggests a diagnosis of acute dilatation of the stomach or paralytic ileus; the lowered blood pressure and the manifestations of peripheral circulatory failure may cause the condition to be ascribed to "shock."

Diagnosis

The differential diagnosis between water and salt depletion and mixed depletion is a comparatively easy matter, depending on recognition of their different modes of causation and awareness of the facts of their clinical and pathological differences.

Estimation of the chloride content of the urine is a most important diagnostic test. Qualitative diagnosis of the type of depletion is not enough. It is essential also that the attempt should be made to arrive at a quantitative diagnosis of the amount of the deficiency of water or salt or of water and salt.

Prevention

This, again, is mainly a matter of awareness of the possible development of water and salt depletion. Fortunately, this state of alert anticipation now generally exists so far as water is concerned. It has become nearly as automatic to chart fluid intake and output of seriously ill patients as to record their temperature and pulse rate.

The best guarantee that water intake is sufficient is an adequate urine volume, in regard to which there are two points of practical importance. The first has already been mentioned: it is that in patients who have inefficient kidneys, incapable of secreting concentrated urine, the daily output of urine may need to be not less than 1.5 litres. Apart from permanent renal inefficiency, temporary damage is frequent in illness; therefore it is seldom advisable to be satisfied with a urine volume of less than 3 pints or 60 oz. (1.7 litres) daily. The point is that, when gross secretion losses are occurred, 24 hours is too long a unit of time to allot for a review of the output; within its span the patient can die of dehydration. In such cases the urine volume and chloride content should be reported to the doctor eight-hourly. The aim should be a pint (570 ml.) per eight hours.

We are not generally aware of the potential hazard of salt depletion. However, it is to be hoped that its importance will soon be realized in this country in all cases suffering losses of alimentary secretions. In the Tropics, when patients are sweating, its menace enters into every form of medical and surgical illness. Whenever salt depletion may occur, the routine testing of the urine for chloride is a matter of first importance—more important, indeed, than the taking of the temperature or the counting of the pulse; not, of course, that these essential procedures should be omitted. The aim in adults should be an NaCl concentration of 3–5 g. per litre.

Treatment of Established Depletions

At the outset it is desirable to call attention to the grave consequences of wrong treatment. In pure water depletion patients require water, and water only, until the deficit has been replaced. The administration of isotonic saline tends to increase existing extracellular hypertonicity, to intensify thirst, and to add to the difficulties of already embarrassed kidneys. It may be lethal. McCance and Young (1944) may be quoted: "Let us suppose that a patient is unable to take anything by mouth and that, in consequence, he is given, during 24 hours, 1,500 ml. of normal saline intravenously—that is, 1,500 ml. of water and (approximately) 15 g. of salt. He will require 1,000 ml. of this water to make good the unavoidable losses from his lungs and skin, and so his kidneys will have the impossible task of excreting 15 g. of salt in 500 ml. of water. . . . The casual administration of saline to young infants is even more dangerous than it is in adult life, for the infant kidney is much less capable of dealing with the superfluity of salt (Young, Hallum, and McCance, 1941; McCance and Young, 1941)." Wrong treatment in salt depletion, on the other hand, chiefly consists in failure to administer saline; in consequence the state of salt deficiency is not relieved and the patient may die of oligaemic circulatory failure. It is probable that hundreds, if not thousands, of patients in this country die annually from salt depletion. In the Tropics the mortality must be much greater.

Though the common and most important therapeutic error in salt depletion is the negative one of omitting to give salt, sometimes there are serious consequences due to the positive error of pressing the administration of water beyond the amount required to compensate unavoidable water losses. When the patient is collapsed and the pylorus closed, the administration of much water by mouth may lead to overfilling of the stomach and to regurgitation or vomiting of the gastric contents, in which the patient may drown, so gravely depressed is the cough reflex. I have seen it happen. Again, when the stage of low blood pressure has been reached anuria develops. Water introduced into the blood stream, whether by absorption from the alimentary tract or direct as intravenous glucose solution, cannot then be excreted in the urine and may cause death from water intoxication (Weir, Larson, and Rowntree, 1922; Helwig, Schutz, and Curry, 1935). Since the plasma and tissue fluid are hypotonic the water must enter the cells. It is probable that turgescence of the cerebral cells is the cause of death, which may be preceded by convulsions. It

is well known that "stoker's cramps" of salt-depletion heat exhaustion particularly tend to be precipitated by the ingestion of large amounts of water.

The special parenteral methods of administration of glucose solution subcutaneously and intraperitoneally—for example, in infants—may precipitate collapse in severe salt depletion by removal of salt from the already depleted plasma. This is because sodium and chlorine ions rapidly diffuse into a tissue depot of injected glucose solution (Darrow and Yannet, 1935). The administration of potassium salts is dangerous in sodium depletion. (In this connexion one has only to remember their danger in Addison's disease.) Sometimes the error of giving potassium to salt-depleted patients who are receiving sulphonamides arises from the routine administration of potassium citrate to alkalinize the urine. In such cases sodium citrate should be used.

Enough has been said about the consequences of wrong treatment to show that there are serious pitfalls in the treatment of different types of dehydration due to water and to salt depletion. The subject is far from being as simple as is often assumed—an assumption which may lead to the control of water and salt administration being left to nurses or junior residents. The essential principle in the treatment of water and salt depletion is that the patient shall be given water or salt, or both, in the amounts that each is lacking. Therefore, as in all conditions, correct diagnosis—in this instance quantitative as well as qualitative—is essential to correct treatment. The facts and principles on which diagnosis depends have been dealt with and need not be recapitulated. The main questions which arise in practical treatment are: (1) What fluid should be administered? (2) How much? (3) By what route? (4) At what rate?

1. The Fluid to Administer

In water depletion, water should be administered by mouth or per rectum, unless the circumstances of the case compel the use of alternative routes—intravenous, subcutaneous, or intraperitoneal. If one or other of these latter routes must be used, then the best vehicle for water is isotonic glucose solution (5%). In salt depletion, isotonic saline solution (0.85%) should be administered when the salt deficiency is giving rise to symptoms and while chloride is still absent from the urine. In very severe salt depletion, with vomiting and circulatory collapse, intravenous administration is indicated, as other routes may be too slow to save life, while oral administration carries the special risk of drowning or, short of drowning, of infecting the bronchial tree. When symptoms are relieved, or when chloride reappears in the urine, isotonic saline should be discontinued in favour of hypotonic saline. It is never desirable to continue isotonic saline administration longer than is necessary, because as soon as salt depletion is relieved there is a tendency for patients receiving isotonic saline to retain sodium and chlorine out of proportion to water (Coller, Iob, Vaughan, Kalder, and Moyer, 1945). For adults the hypotonic concentration of choice is 1/2 isotonic (0.425%) until the salt balance appears to be fully restored, and then, if food is not being taken and salt intake must be derived from fluid 1/3 isotonic for maintenance. If parenteral routes are being employed these strengths may be achieved by mixing one part of isotonic saline solution with one or two parts of isotonic glucose solution. In the case of children particular care should be taken not to continue too long with isotonic saline; indeed, some authorities consider the possible dangers to infants to be so great that isotonic saline should never be used. Suitable hypotonic concentrations for infants are 1/4 or 1/5 isotonic—that is, for parenteral use, one part of isotonic saline mixed with three or four parts of isotonic glucose solution. In mixed water and salt depletion, or if there is any doubt as to the nature of the depletion, the patient should from the start receive hypotonic saline in the strengths above indicated.

It may be asked whether simple saline solution is sufficient to repair electrolyte deficiencies consequent upon loss of alimentary secretions, and, in particular, whether or not adjustments in the nature of the solution should be made to rectify alterations in the acid–base balance. This question is not really finally settled, but most authorities would, I think, agree with Gamble (1942) that saline or saline mixed with glucose solution is all that is needed. For a discussion of the considerations involved Gamble's monograph should be consulted.

2. Amount of Fluid

The essential principle is that the amount given, whether of water or saline, shall be enough to restore the patient to a normal state of balance. As shown in preceding sections, the initial deficit in a 70-kg. (or 11-stone) man may range up to a maximum of 10 litres (18 pints) of water in water depletion, or the equivalent of 10 litres of isotonic saline in salt depletion. The clinical criteria for the rough estimation of the volume of depletion have been given. In addition to the initial deficit, allowance must be made for losses going on during the period of fluid administration. The best check on restoration of water and salt is provided by eight-hourly measurements of the volume of urine and estimation of its chloride content. The aim per eight hours in an adult should be a urine volume of not less than a pint (570 ml.) and a salt content of 3 to 5 g. per litre. In infants urine measurement and testing for chloride present special practical difficulties. Yet they would seem to be even more important than in adults, because infants die so quickly from fluid depletion and because their kidneys have not the same power of correcting therapeutic errors. I have not the practical experience needed to attempt to define figures. All that can be said is that infants need to pass relatively much larger volumes of urine with lower chloride content.

During the intravenous administration of saline some NaCl may spill into the urine even though the patient is still grossly salt-deficient. For this reason if testing the urine shows the presence of chlorine it is wise to discontinue the saline, substituting glucose solution if it is desired to continue a drip infusion, and then half an hour and an hour and a half later instruct the patient to pass urine. The 30-minute specimen should be discarded and the 90-minute specimen tested for chlorine.

In fluid restoration a quantitative attitude of mind is essential, and it is necessary to realize clearly the considerable magnitude of fluid deficit which may be present in a case of water, salt, or mixed depletion. Fortunately, we are passing out of the days when patients deficient of perhaps 1½ to 2 gallons (6.8 to 9 litres), and suffering continuing losses, received a pint or two of fluid, though the approach is still often too homoeopathic.

3. Route of Administration

Some remarks concerning this question have already been made. In severe salt or in mixed depletion the intravenous route should be used and the continuous-drip method employed. Otherwise, whenever circumstances permit, the oral route is the best. If the patient has difficulty in drinking, a most valuable device is the transnasal intragastric drip. This method consists in fluid administration, by continuous drip, through a Ryle's tube passed via the nose into the stomach. It was particularly exploited by Ransome, Gupta, and Paterson (1944), who have recorded their experience with 355 acute medical cases, and their paper should be consulted for details of the very simple technique. Their work was done at a large military hospital in Assam, and more than 100 of the cases were in-patients in various degrees of coma from cerebral malaria. The nursing facilities were far from being on the scale of British civil hospitals, yet the method was found easy to run in practice. Nauth-Misir (1946) has written on the use of this method in infants, in whom it would seem to be particularly useful. The technique of the continuous intravenous drip, originated by Matas (1924), is too well known to need comment.

I would like to draw attention to the value of rectal fluid administration when properly carried out in accordance with the principles of Murphy (1909, 1916). The technique and also other methods of parenteral fluid administration have been described (Marriott and Kekwick, 1937).

4. Rate of Administration

The desirable rate of fluid administration depends on the state of the patient. The need for rapid intravenous administration arises in patients suffering from peripheral circulatory failure due to severe salt depletion or mixed depletion. Such cases are urgent emergencies, and the rate of administration for adults should be of this order: the first pint in 10 minutes, the second pint in 15 minutes, the third pint in 20 minutes, and the fourth pint in 30 minutes; then a pint every two hours till the blood pressure is restored to normal. Thereafter a pint every four hours (more under tropical conditions). In infants the quantities should be on a similar scale in proportion to body weight. In less acute depletions slower restoration is indicated. However, an adult suffering from a degree of either water or salt depletion sufficient to cause symptoms will need to receive within the first 24 hours a minimum of a gallon (4½ litres) of appropriate fluid. Watch must always, of course, be kept on urine excretion and for signs of oedema, especially pulmonary oedema.

Complicated Cases

Special difficulties and dangers are associated with fluid administration to patients who have suffered from acute haemorrhage or who are anaemic or hypoproteinaemic (Power, Pedersen, and Maddock, 1942); to those in whom anoxia or toxaemia has increased capillary permeability, especially the permeability of pulmonary capillaries (Daly, 1946); and to those whose kidneys are badly damaged. In all such cases most careful consideration must be given to what is done, and very close watch maintained for the development of pulmonary oedema during fluid administration. Patients who have suffered from haemorrhage should receive preliminary blood transfusion to restore blood volume. Those who are seriously anaemic should, if possible, have their haemoglobin restored by drip transfusion (Marriott and Kekwick, 1935, 1940) while fluid administration by other routes proceeds. Patients with hypoproteinaemia should, if possible, similarly receive plasma transfusions, and anoxic patients should be given oxygen.

Water and salt are, perhaps, practically the most important substances it is in our power to administer. They can be so used that they can achieve seeming miracles; or they can be so misused as to lead to a fatal issue. Their proper use is not the simple matter it is often assumed to be. The true approach to understanding is one of humility.

Postscript

A few days before these lectures were delivered an article by Prof. E. B. Verney appeared (*Lancet*, 1946, **2**, 739 and 781) which I did not see until later. In this important paper, recording much precise experimental work, it is shown that liberation of posterior pituitary antidiuretic hormone is determined by the osmotic pressure of the arterial plasma. The hypothesis is advanced that changes in this pressure are appreciated by "osmoreceptors" which are continually engaged in controlling the antidiuretic function of the pituitary. Verney's work thus confirms, from another angle, the paramount importance of the maintenance of the isotonicity of the extracellular fluid. It also implies that renal activity in preserving such isotonicity may be largely or wholly dependent on the functional linkage between the neurohypophysis and the kidneys. The influence of the pituitary antidiuretic hormone on renal water excretion has, of course, been known for many years—largely due to the researches of Verney. However, his latest work, showing that the production of this hormone is related to plasma osmotic pressure, makes a big forward step. His findings do not affect the clinical views expressed in these lectures, but they are important in helping to reveal the physiological mechanism by which the kidneys guard the osmotic constancy of the "internal environment."

I wish to thank Prof. J. L. Gamble, of Harvard, for his generous permission to reproduce his diagrams (Gamble, 1923, 1942) showing the composition of the body fluids. His concise monograph (1942) is a masterpiece of lucid verbal and diagrammatic exposition. To Prof. R. A. McCance I am indebted for supplying references, and I would like to pay tribute to the great importance of the work he has done in this field. I wish also to thank Dr. D. A. K. Black, Dr. A. Kekwick, and Dr. N. F. Maclagan, who have kindly given me references.

References

Abbott, W. E. (1946). *Amer. J. med. Sci.*, **211**, 232.
Ambard, L., and Papin, E. (1909). *Arch. int. Physiol.*, **8**, 432 (quoted by McCance, 1945).
Anderson, I. A., and Lyall, A. (1937). *Lancet*, **1**, 1039.
Bartlett, R. M., Bingham, D. L. C., and Pedersen, S. (1938). *Surgery*, **4**, 441; 614.
Benedict, E. G. (1915). *A Study of Prolonged Fasting*, Carnegie Institution of Washington, D.C.
Black, D. A. K. (1939). *Lancet*, **1**, 323.
—— (1940a). Ibid., **2**, 618.
—— (1940b). *British Medical Journal*, **2**, 693.
—— (1942). *Quart. J. Med.*, **35**, n s.11, 77.
—— (1946). *Lancet*, **2**, 671.
—— McCance, R. A., and Young, W. F. (1942). *Nature*, **150**, 461.
—— —— —— (1944). *J. Physiol.*, **102**, 406.
—— Powell, J. F., and Smith, A. F. (1941). *J. Physiol.*, **99**, 344.
Blotner, H. (1941). *Amer. J. med. Sci.*, **202**, 222.
Bruckman, F. S., and Peters, J. P. (1930). *J. clin. Invest.*, **8**, 591.
Caplan, A. (1942). *Bull. Kolar Gold Fields Mining and Metallurgical Soc.*, No. 54, p. 32.
Cave, H. W. (1946). *Ann. Surg.*, **124**, 716.
Chunn, C. F., and Harkins, H. N. (1941a). *Amer. J. med. Sci.*, **201**, 745.
—— —— and Boals, R. T. (1941b). *Arch. Surg.*, **43**, 773.
Coller, F. A., Iob, V., Vaughan, H. N., Kalder, N. B., and Moyer, C. A. (1945). *Ann. Surg.*, **122**, 663.
—— and Maddock, W. G. (1935). Ibid., **102**, 947.
Cutler, H. H., *et al.* (1938a). *Proc. Mayo Clin.*, **13**, 244.
—— —— (1938b). *J. Amer. med. Ass.*, **111**, 117.
Daly, I. de Burgh (1946). *Thorax*, **1**, 182.
Darrow, D. C., and Yannet, H. (1935). *J. clin. Invest.*, **14**, 266.
Davies, H. W., Haldane, J. B. S., and Peskett, G. L. (1922). *J. Physiol.*, **56**, 269.
De Wesselow, O. L. V. (1924). *Int. Clin.*, **3**, 191.
Dick, D. S. (1944). *Lancet*, **2**, 170.
Dill, D. B. (1938). *Life, Heat and Altitude*, Cambridge, U.S.A.
Eitel, H., and Loeser, A. (1934). *Dtsch. Z. Chir.*, **243**, 781.
Evans, E. I. (1945). *Sth. med. J.*, **38**, 214.
—— James, G. W., and Hoover, M. J. (1944). *Surgery*, **15**, 420.
Evans, P. (1942). *Lancet* **1**, 162.
Fantus, J. B. (1936). *J. Amer. med. Ass.*, **107**, 14.
Gamble, J. L. (1937). *Johns Hopk. Hosp. Bull.*, **61**, 151, 174.
—— (1942). *Chemical Anatomy, Physiology and Pathology of Extracellular Fluid*, Boston.
—— and Butler, A. M. (1944). *Trans. Ass. Amer. Phys.*, **58**, 157.
—— Ross, G. S., and Tisdall, F. F. (1923). *J. biol. Chem.*, **57**, 633.
Harrop, G. A., Weinstein, A., Soffer, L. J., and Trescher, J. H. (1933). *J. exp. Med.*, **58**, 13.
Helwig, F. C., Schutz, C. B., and Curry, D. E. (1935). *J. Amer. med. Ass.*, **104**, 1569.
Himsworth, H. P. (1946). *Proc. roy. Soc. Med.*, **40**, 27.
Holbrook, A. A., and Watson, M. V. (1939). *Amer. J. med. Sci.*, **198**, 750.
Hunt, E. H. (1912). *J. Hyg.*, Camb., **12**, 479.
Jones, F. Avery (1939). *British Medical Journal*, **2**, 332.
Keith, N. M. (1919). *M.R.C. Shock Committee Reports*, **27**, 1.
Kekwick, A., and Marriott, H. L. (1940). *Lancet*, **2**, 193.
—— —— Maycock, W. D'A., and Whitby, L. E. H. (1941). *Lancet*, **1**, 99.
Kerkhof, A. C. (1938). *Ann. intern. Med.*, **11**, 1407.
Kerpel-Fronius, E. (1935). *Z. Kinderheilk.*, **57**, 489.
Kuno, Y. (1934). *Physiology of Human Perspiration*, London.
Ladell, W. S. S., Waterlow, J. C., and Hudson, M. F. (1944). *Lancet*, **2**, 491, 527.
Landis, E. M. (1937). *Amer. J. med. Sci.*, **193**, 297.
Lavietes, P. H., D'Esopo, L. M., and Harrison, H. E. (1935). *J. clin. Invest.*, **14**, 251.
Lee, D. H. K., Murray, R. E., Simmonds, W. J., and Atherton, R. G. (1941). *Med. J. Austral.*, **2**, 249.
Leevy, C. M., Strazza, J. A., and Jaffin, A. E. (1946). *J. Amer. med. Ass.*, **131**, 1120.
Loeb, R. F. (1941). Ibid., **116**, 2495.
Lyall, A., and Nicol, B. M. (1939a). *Lancet*, **1**, 144.
—— —— (1939b). *J. Physiol.*, **96**, 21.
McCance, R. A. (1936). *Lancet*, **1**, 643, 704, 765, 823.
—— (1938). *J. Physiol.*, **92**, 208.
—— (1945). Ibid., **104**, 196.
—— (1946). *Schweiz. med. Wschr.*, **76**, 857.
—— and Widdowson, E. M. (1938). *J. Physiol.*, **91**, 222.
—— and Young, W. F. (1941). Ibid., **99**, 265.
—— —— (1942). *Arch. Dis. Childh.*, **17**, 65.
—— —— (1944). *Brit. med. Bull.*, **2**, 219.
Maegraith, B. G., *et al.* (1945). *Lancet*, **2**, 293.
Marriott, H. L. (1935). *Treatment of Acute Poisoning*, London.
—— (1943). *Proceedings of Conference of Medical Specialists of Eastern Army*, March, 1943, p. 2; Govt. of India Press, Calcutta.
—— (1945a). *Lancet*, **1**, 679.
—— (1945b). *J. I.A.M.C.*, **1**, 15.
—— (1946). Unpublished observations.
—— and Kekwick, A. (1935). *Lancet*, **1**, 977.
—— —— (1937). *Practitioner*, **139**, 250.
—— —— (1940). *British Medical Journal*, **1**, 1043.
—— and Wynne Willson, W. W. (1940). Unpublished work.
Marsh, F. (1937). *British Encyclopaedia of Medical Practice*, **6**, 396, London.
Matas, R. (1924). *Ann. Surg.*, **79**, 643.
Moss, K. N. (1923). *Proc. roy. Soc., B.*, **95**, 181.

Murphy, J. B. (1909). *J. Amer. med. Ass.*, **52**, 1248.
—— (1916). *Surg. clin. Murphy*, **5**, 1169.
Nadal, J. W. (1942). *Amer. J. Surg.*, **56**, 282.
—— Pedersen, S., and Maddock, W. G. (1941). *J. clin. Invest.*, **20**, 691.
Nauth-Misir, T. N. (1946). *British Medical Journal*, **2**, 737.
Newburgh, L. H (1935). *J. Amer. med. Ass.*, **105**, 1034.
—— and Johnston, M. W. (1942). *Physiol. Rev.*, **22**, 1.
—— and Lashmet, F. H (1932). *J. clin. Invest.*, **11**, 1003.
—— —— (1933). *Amer. J. med. Sci.*, **186**, 461.
Perazzo, G. (1937). *Arch. ital. Chir.*, **47**, 163.
Peters, J. P. (1935). *Body Water: The Exchange of Fluids in Man*, Baltimore.
—— (1942). *Ann. Rev. Physiol.*, **4**, 89.
—— (1944). *Physiol. Rev.*, **24**, 491.
Phillips, R. A., and Van Slyke, D. D. (1943). *Bull. U.S. Army Med. Dept.*, **71**, 66.
Power, F. H., Pedersen, S., and Maddock, W. G. (1942). *Surgery*, **12**, 438.
Ransome, G. A., Gupta, L. M., and Paterson, J. C. S. (1944). *British Medical Journal*, **2**, 594.
Robertson, O. H., and Bock, A. V. (1919). *M.R.C. Shock Committee Reports*, **25**, 213.
Robinson, F. J., Power, M. H., and Kepler, E. J. (1941). *Proc. Mayo Clin.*, **16**, 577.
Rogers, L. (1908). *Indian med. Gaz.*, **43**, 90.
—— (1909a). *Proc. roy. Soc., B*, **81**, 291.
—— (1909b). *Indian med. Gaz.*, **44**, 401.
—— (1911). *British Medical Journal*, **2**, 1404.
—— (1915). *Lancet*, **2**, 219.
—— (1916). *Ann. trop. Med. Parasitol.*, **10**, 139.
—— (1921). *Bowel Diseases in the Tropics*, London.
Rowntree, L. G. (1922). *Physiol. Rev.*, **2**, 116.
—— and Snell, A. M. (1931). *A Clinical Study of Addison's Disease*, Mayo Clinic Monographs, Philadelphia.
Sanchez-Vegas, J., and Collins, E. N. (1946). *Amer. J. med. Sci.*, **211**, 428.
Sanctorius, S. (1614). *De Statica Medicina Aphorismorum Sectionibus Septem Comprehensa*, Leipzig.
Saphir, W. (1945). *J. Amer. med. Ass.*, **129**, 510.
Schemm, F. R. (1942). *Ann. intern. Med.*, **17**, 952.
—— (1944). Ibid., **21**, 937.
Seligman, A. M., Frank, H. A., and Fine, J. (1946). *J. clin. Invest.*, **25**, 1.
Starling, E. H. (1895–6). *J. Physiol.*, **19**, 312.
Stewart, J. D., and Rourke, G. M. (1942). *J. clin. Invest.*, **21**, 197.
Taylor, H. L., Henschel, A., Mickelsen, O., and Keys, A. (1943). *Amer. J. Physiol.*, **140**, 439.
Wangensteen, O. H. (1942). *Intestinal Obstructions*, Baltimore.
Weech, A. A., and Ling, S. M. (1931). *J. clin. Invest.*, **10**, 869.
—— Snelling, C. E., and Goettsch, E. (1933). Ibid., **12**, 193.
Weir, J. F., Larson, E. E., and Rowntree, L. G. (1922). *Arch. intern. Med.*, **29**, 306.
White, H. D. (1943). Personal communication.
Whittaker, S. R. F., and Winton, F. R. (1933). *J. Physiol.*, **78**, 339.
Young, W. F., Hallum, J. L., and McCance, R. A. (1941). *Arch. Dis. Childh.*, **16**, 243.

THE SWALLOWING OF FOREIGN BODIES

BY

W. LINDESAY NEUSTATTER, M.D., B.Sc., M.R.C.P.

Late Lieut.-Col., R.A.M.C.; Physician for Psychiatry, Queen Mary's Hospital for the East End and the Royal Hampshire County Hospital

Recently an epidemic of foreign-body swallowing resulted in the admission of 11 cases into a military hospital in the course of a few months.* For the purpose of investigation the 11 "swallowers" were compared with 11 psychopaths and 11 clearly stable prisoners as controls. The psychopathic controls were the usual unstable, impetuous, emotional types with overflowing crime sheets; the normal controls were deserters, most of them young men whose nerve had gone during the course of the Italian campaign, but who had otherwise blameless records and were well-behaved in prison. I interviewed the prisoners alone, if necessary several times. I explained that the inquiry was a medical one, that nothing they said would be held against them, and that they had nothing to gain personally, though ultimately all prisoners might benefit from the information obtained.

* See Major Hallett's paper, which includes cases not in this series. Some of my series had had operations in other hospitals previously, hence any discrepancies.

Results

The most striking fact which emerged was that the "swallowers" (Group I) fell very definitely into two subgroups: (*a*) those who had only pretended to swallow, or who had swallowed harmless objects in an entirely calculating manner in the hope of being sent to hospital, which was outside the prison; and (*b*) those who had swallowed objects when in a highly emotional state with a considerable degree of depression present. In the latter group operation was necessary on various occasions, the six of them having had 15 abdominal operations in all (over a period of months or years) compared with two operations needed by the former. The accompanying tables make a comparison of the swallowers and the control groups on matters which I hoped would throw light on the causes of the swallowing; to facilitate ease of comparison the subgroups Ia and Ib are compared on a basis of 11 (see the figures in parenthesis).

Table I (A) shows the preponderance of bad home conditions in childhood. As the items enumerated—

TABLE I

	Group Ia* (5 Cases)	Group Ib (6 Cases)	Group II (11 Cases)	Group III (11 Cases)
No. of operations required	2 (4)	15 (27)	0	0
A. Home conditions in childhood:				
Father violent	0	3 (6)	1	0
„ alcoholic	0	2 (4)	2	1
„ brutal	1 (2)	3 (6)	3	1
Parental disharmony	1 (2)	2 (4)	4	1
„ separation	0	1 (2)	1	1
Total	2 (4)	11 (20)	11	4
B. Youthful instability:				
Truancy from school	1 (2)	2 (4)	3	0
Adolescent delinquency	1 (2)	3 (6)	4	0
Violent-tempered child	2 (4)	2 (4)	1	0
Nervous child	2 (4)	1 (2)	2	0
In reformatory	2 (4)	0	2	0

* The results showed Groups Ia and Ib so essentially different that the comparison of figures for the total of Group I seemed valueless. The figures in parenthesis are on a basis of 11 (approx.).

alcoholic father, matrimonial disharmony, etc.—are various aspects of an unsatisfactory home situation I felt it legitimate to add these: it will be seen there is the usual preponderance of these factors in the psychopaths, whether swallowers or not. Table I (B) shows a similar but less striking difference in traits indicative of instability in childhood. The matters recorded in Table II were designed to

TABLE II.—*Adult Instability and Affective Reactions*

	Group Ia (5 Cases)	Group Ib (6 Cases)	Group II (11 Cases)	Group III (11 Cases)
Anxious in prison	1 (2)	6 (11)	4	3
Depressed „	0	6 (11)	3	2
Emotional „	2 (4)	4 (8)	4	1
Aggrieved „	0	2 (4)	1	0
Paranoid attitude	0	2 (4)	1	0
Aggressive	1 (2)	3 (6)	1	0
Harassed and drawn facies	1 (2)	6 (11)	3	1

reveal traits indicative of markedly emotional personalities. Anxiety and depression were recorded from subjective complaints; the other items were my observations. It will be seen that there is a steady decline in the incidence of affective reactions from Group I to Group III, but the most striking difference is between Groups Ia and Ib. Of the latter group of 6 "true swallowers," 6 were anxious and depressed, 4 had drawn facies, and 4 were very emotional, in contrast to 1, 0, 1, 2, for the same traits in Group Ia.

Table III deals with factors which my previous experience of prisoners suggested might be of aetiological significance—namely, treatment by the prison staff, prohibition of smoking, and the food. It will be seen that the results

TABLE III.—*Aetiological Factors*

	Group Ia (5 Cases)	Group Ib (6 Cases)	Group II (11 Cases)	Group III (11 Cases)
Complaints:				
Of bad treatment in prison ..	0	1 (2)	2	0
Of no smoking	3 (6)	4 (8)	4	5
Of poor food	1 (2)	2 (4)	2	0
Effects of solitary confinement:				
Severe	0	4 (8)	1	1
Moderately severe	1 (2)	2 (4)	3	0
Dislike	2 (4)	0	4	4
Indifference	2 (4)	0	3	6

were much the same for all the groups, the ban on smoking heading the list. It is noteworthy that out of 33 prisoners, 22 of whom had been selected as the most recalcitrant, only 4 should allege unsatisfactory treatment and 5 complain of the food—results which reflect favourably on the prisons concerned.

Solitary Confinement.—The prisoners were locked in their cells from 4.30 p.m. to 6 a.m., and for dinner. Their reactions to this have been recorded as follows: (1) Severe and moderately severe, referring to the intensity and duration of depressive reactions, with or without anxiety; the latter did not exist without the former. The depressions were not "psychotic"—i.e., there was no retardation or delusions, etc.—but both severe and moderately severe reactions would ordinarily have caused these patients to be admitted for observation for their own safety. (2) Dislike—a term used to designate a natural but not pathologically intense objection to solitary confinement. (3) Indifferent—some prisoners being apparently completely unconcerned about it. Solitary confinement produced the greatest reaction among the true swallowers, and, as the histories show, appeared to have been the most immediate precipitant factor, for 4 were severely and 2 moderately affected—i.e., all were reacting to a pathological extent. The other psychopaths—Group II—came next: 3 were moderately and 1 severely affected—the last a depressed schizoid type who made a determined attempt at suicide. Only 1 normal control was severely affected and none moderately. Again it is noteworthy that of the pseudo-swallowers, only 1 had a moderately severe reaction and none a severe one.

An attempt was made to carry out intelligence and personality pointer tests, similar to those used at Officers Selection Boards. These resulted in failure. Lack of time made testing in groups necessary, with the result that the psychopaths and swallowers mostly behaved so preposterously—ranging from a sullen refusal to co-operate to giggling like hysterical schoolgirls—that no results were obtained. But it gave me an illuminating insight into the difficulties of the prison staff.

Discussion

The numbers concerned in this inquiry are too small for statistical analysis. The results, however, are in keeping with my own impressions over a longer period; but their validity is also largely dependent on the honesty of the prisoners' statements. Apart from lack of insight, one naturally suspects that these might be influenced by fear or by a desire to curry favour. But I had made it quite clear that the men had nothing to gain personally, nor would those in charge be informed of anything which might cause prejudice, and their case histories would be recorded anonymously. The prisoners seemed to be replying honestly, and the preposterous behaviour of the psychopaths was not suggestive of any feeling of intimidation. Some representative case histories should assist in assessing the results.

Group Ia.—One man was in prison for absence and stealing; he was plausible and took prison philosophically. He admitted he had pretended to swallow some wire, but "would not have been so silly" as really to swallow anything harmful. Another was in prison for robbery with assault. Deported from Australia as undesirable when a youth, he struck me as a hard, tough, calculating type who would be undeterred from any crime he could get away with. He readily admitted he had lied about swallowing, remarking spontaneously that he knew it was dangerous. Another, who swallowed a toothbrush and buttons, said he would not have done so had he expected to lose the whole of his remission. This remark sums up the attitude of this group: they would do anything that gained them something, provided the disciplinary consequences were not too severe and that they did not really injure themselves.

Group Ib.—One man swallowed foreign bodies three times. His parents had separated; he had been a hot-tempered and delinquent boy, who, when his sisters married men he did not like, stole their cutlery "to try and break their homes up." He felt that his family was against him, that "someone would get him," and asserted that a theft of mail for which he was in prison was due to a desire to make "fellows at the unit who had victimized him suffer." He swallowed as "he could stick it no longer in prison." When I saw him after his second attempt he said: "I wish I had succeeded. If they put me back in that hell I shall do it again"; which he did, necessitating a third abdominal operation. On examination he was backward, and though only 26 his face was heavily lined, he was tense with emotion, spoke of his "wrongs" with great feeling, and exhibited dread of solitary confinement. Another man who swallowed three times had left home at 14 as he had a violent alcoholic father who beat him. He had twice been a corporal and twice imprisoned for stealing, and had been punished for numerous absences. Recently he had improperly used an Army vehicle to drive about a girl "he was very much in love with," and finally stole it. She wanted to throw him over in consequence, and he then "beat her up." After his court martial he said he tried to commit suicide six different ways. In the cells at night he could not sleep "for thinking what a fool he had been," and kept on ruminating about violence and suicide. He was a sturdy individual, with heavily lined facies, co-operative but listless. His depression improved somewhat in hospital, but as soon as he returned to prison he swallowed a foreign body again, necessitating further operation. He lay brooding in hospital, and after trying to strangle himself with a pyjama cord was transferred to a neuropathic hospital.

These are typical examples of this group, and bring out the striking contrast between the two classes of swallower, illustrating their past and present instability and their unsatisfactory home lives, and emphasizing the detrimental effect long hours of solitary confinement can have on emotionally unstable prisoners. This would appear also to be the view of such an authority as Norwood East.* (It should be added that the long hours of solitary confinement were necessitated by shortage of staff and suitable accommodation and were not favoured by the commandants—though it is also necessary to realize that the problem is complex, as undiluted psychopathy in dormitories is not conducive to peace and quiet.)

In contrast to the psychopaths, it is remarkable how completely indifferent some of the stable types were in this respect; nevertheless, with young deserters, some of whose nerve had gone under very severe stress and who were clinically indistinguishable from those who went "down the line" medically, it is very questionable if solitary confinement is not uneconomic in retarding their

* Norwood East, *Medical Aspects of Crime*, Churchill, London.

rehabilitation as soldiers, which is the aim of military prisons.

Finally, these findings would appear to reflect on a small scale the problem of the disposal and reform of the psychopath generally. Clearly law and order must be maintained, but the objection to our present methods is that they so often do not deter the psychopath, while if they result in severe emotional reactions and repeated disturbed behaviour they are not of reformative value. But, utilitarian reasons apart, punishment causing such a degree of purposeless mental suffering is surely as repugnant as the infliction of physical suffering, which nowadays is contrary to accepted doctrine. Moreover, paradoxically the psychopath, who from the very temperamental defects which drive him into crime tolerates the rigid discipline of prison life less well than the stable criminal, is morally less culpable. For the former often appears genuinely incapable of controlling his impulses, whereas the latter desists from crime if it does not pay and takes his punishment philosophically if caught. It is to be hoped that the Criminal Reform Bill will grapple with this problem.

Summary and Conclusions

Eleven cases of the swallowing of foreign bodies by prisoners were investigated: 5 only pretended to do so, or swallowed harmless objects, and required two operations between them; 6 swallowed objects and needed 15 major operations in all. The former were stable, the latter emotional and depressed, and all 6 were markedly affected by solitary confinement. The swallowing of foreign bodies therefore appears either to be due to very mundane causes or to be caused by severe depression in unstable individuals.

I should like to make acknowledgments to Col. G. D. Gripper, the O.C. of my hospital, and to 'Lieut.-Cols. Jarret and Mackay, O.C.s of the military prisons concerned, who took great trouble to facilitate my investigation. I also wish to thank Capt. Oliver, psychologist to a W.O.S.B., for his help in our abortive attempt to test the prisoners.

SWALLOWED FOREIGN BODIES

SOME CASES TREATED IN A MILITARY HOSPITAL

BY

G. St. J. HALLETT, F.R.C.S.

Major, R.A.M.C.

The practice of swallowing foreign bodies as a means of gaining admission to hospital is not uncommon in military prisons. The treatment of these cases presents many problems, both surgical and psychiatric. There are two large detention barracks in the area served by this hospital and 19 individuals have been treated here for the condition. Some have been admitted on several occasions, making a total of 29 admissions.

It is proposed to deal with only the surgical aspect. The cases have been set out in the accompanying Table, from which it will be seen that the outcome has been as follows:

Foreign bodies passed per rectum ..		20
Operations		12
Gastrotomy	7	
Caecostomy	1	
Colostomy	1	
Laparotomy only	3	
Deaths		0

A surprising assortment of objects have passed through the intestinal tract with impunity. These include nails, pieces of glass, spoon handles, pieces of wire, brass buckles, broken razor-blades, and, on one occasion, a needle. They have appeared at intervals of from 48 hours to 12 days after being swallowed.

Table Showing Analysis of Cases

Case No.	Date	Object Swallowed	Treatment	Comment
1	4–13/4/45	Collar hook and buttons	No operation	Passed per rectum
	20/4/45–12/5/45	Numerous F.B.s	Gastrotomy on 22/4/45; 22 metallic F.B.s removed	Uneventful recovery
	25/5/45–6/6/45	2 screws	No operation	Passed per rectum
	6/6/45	Numerous F.B.s	Gastrotomy 11/6/45	Uneventful recovery. Transferred to mental hospital
2	17/4/45–2/5/45	Spoon handle	No operation	Passed per rectum
3	21/4/45–15/5/45	,, ,,	Gastrotomy 22/4/45. F.B. removed	Uneventful recovery
	23/5/45–6/6/45	Nails, etc.	No operation	Passed per rectum
	12–29/6/45	Spoon handle and other F.B.s	Gastrotomy 18/6/45. Spoon handle removed. Other F.B.s had passed pylorus	Uneventful recovery. Other F.B.s passed per rectum
	14–30/11/45	Spoon handle	No operation	On 24/11/45 F.B. still in stomach. Pre-operative radiograph after morphine and hyoscine showed F.B. to have passed pylorus. Ultimately passed per rectum. Transferred to mental hospital
	13/6/45–2/7/45	Nails and other small F.B.s	Laparotomy 18/6/45	Nothing palpable in stomach. Abdomen closed without further exploration. F.B.s passed per rectum
4	8–30/7/45	Thermometer and various bits of wire	Gastrotomy 19/7/45. F.B.s removed	Uneventful recovery
	10/1/46	Spoon handle	No operation	Passed per rectum
5	17–20/6/45	Various small F.B.s	,,	,, ,,
6	18–24/6/45	Spoon handle	,,	,, ,,
7	19/6/45–22/9/45	3 pieces of wire	Laparotomy. Removal of wire from pelvic colon. Colostomy 30/6/45	Progress of F.B. observed by radiographs every 3 days. Wire perforated pelvic colon on 11th day. Uneventful recovery
8	5–16/7/45	2 spoon handles	Gastrotomy 6/7/45. F.B.s removed	Uneventful recovery
9	20–21/7/45	Pieces of glass	No operation	Passed per rectum, after discharge from hospital
10	7–18/8/45	Open safety-pin	Laparotomy 7/8/45. Pin removed from caecum	Uneventful recovery
	17–18/9/45	Various small metallic F.B.s	No operation	Passed per rectum, after discharge from hospital
11	20–25/8/45	Spoon handle	,,	Pre-operative radiograph after morphine and hyoscine on 25/8/45 showed F.B. to have passed pylorus. Passed per rectum
	24–25/1/46	2 spoon handles	,,	Passed per rectum, after discharge from hospital
12	7–20/11/45	Spoon handle	Laparotomy. F.B. had passed pylorus. Abdomen closed without further search	Passed per rectum
13	24/11/45–13/12/45	Toothbrush handle, spoon handle, and wire	Gastrotomy 30/11/45. F.B.s removed	Uneventful recovery
14	10–17/1/46	Three small metallic F.B.s	No operation	Passed per rectum
15	16–18/1/46	Ring and other small F.B.s	,,	Passed per rectum, after discharge from hospital
16	16–18/1/46	Spoon handle	,,	,, ,, ,, ,,
17	16–18/1/46	Screws and other small F.B.s	,,	,, ,, ,, ,,
18	19–26/1/46	Sewing needle	Laparotomy 20/1/46. Needle passed pylorus. Abdomen closed without gastrotomy	Passed per rectum 26/1/46
19	21–23/1/46	Spoon handle and piece of wire	No operation	Passed per rectum, after discharge from hospital

Perforation occurred only in Case 7. On this occasion a piece of wire 3 in. (7.5 cm.) long became impacted in the pelvic colon for seven days. At operation the wire was found projecting into the peritoneal cavity through a hole in the pelvic colon and there was considerable pelvic peritonitis. The wire was removed, the bowel repaired, and a left iliac colostomy performed. This was later closed, but the man was in hospital for three months. The chances of perforation are evidently not great; nevertheless every effort must be made to avert it. It has been suggested that it is worth swallowing some cotton-wool in the hope that it will entangle a sharp foreign body in a woolly bolus. This was tried on one or two occasions, but with no noticeable effect. Liquid paraffin may safely be given, but it is not advisable, on theoretical grounds, to give any purgatives, as convulsive movements of the bowel might precipitate a perforation.

In some of the earlier cases in this series it was considered, from the size or quantity of objects in the stomach, that they were unlikely to negotiate the intestinal tract without damage, and in these laparotomy was performed. However, in several cases, although the foreign bodies had been shown in pre-operative radiographs, when the abdomen was opened nothing was palpable in the stomach. The abdomen was closed without further exploration, and in all cases the foreign bodies ultimately appeared per rectum. It seems likely that an injection of morphine and hyoscine relaxes the pylorus and helps the stomach to empty. This was given with success in Cases 3 and 11, and it is well worth trying where there is no indication for early operation.

Indications for Operation

1. It is advisable to remove objects which remain in the same position in the bowel for seven or eight days. The mucosa of the stomach which has retained foreign bodies for more than a week is found at operation to be very congested and oedematous. In these circumstances there is clearly a danger of perforation even with blunt objects. So long as there is slow progress operation is not called for. In several cases spoon handles have been passed naturally after 10 to 12 days.

2. Sharp-pointed needles or objects unlikely from their shape to negotiate the intestinal tract are better removed from the stomach, where their location is relatively easy and where the bowel can be most safely opened.

3. If perforation occurs.

The routine treatment adopted has been to keep these men under observation on a normal diet and to take radiographs every three days. Operation was undertaken only in the presence of one or other of the indications enumerated above.

I am indebted to Col. G. D. Gripper for permission to publish these cases.

At a meeting of representatives of special hospitals organized for postgraduate teaching held at the Hospital for Sick Children on Feb. 11, with Sir Ernest Gowers in the chair, it was unanimously decided to set up a representative body to be known as the Association of Postgraduate Teaching Hospitals of Great Britain. Membership of the association is limited to hospitals or groups of hospitals having directly attached to them institutes federated or about to be federated to the British Postgraduate Medical Federation (University of London) or, in the case of provincial hospitals, institutes recognized and financially supported by a university as postgraduate teaching centres. The objects of the new association were defined as "to keep under review all matters peculiarly affecting the interests of the member hospitals, and to act as a negotiating body directly with the Ministry of Health, universities, local authorities, and other bodies on behalf of those hospitals on such matters as may peculiarly affect them." The acting hon. secretary is Mr. John Young, of the Royal National Throat, Nose and Ear Hospital, Gray's Inn Road, London, W.C.1.

VARIATION IN THE TITRE OF Rh ANTIBODY DURING PREGNANCY

BY

M. D. HICKEY, M.D., M.Sc., M.R.C.P.I., D.P.H.

AND

E. de VALERA, M.D., M.A.O., M.R.C.P.I.

(From the Mater Misericordiae Hospital, Dublin)

Many published cases indicate that severe erythroblastosis may occur where there is only a comparatively low titre of antibody in the maternal serum—for example, Cases 1, 3, and 6 of a series recently published by Cappell (1946). This author suggests that a rising titre of maternal antibody during pregnancy would indicate the presence of a Rh-positive foetus. He also says that the foetus may be affected without any such rise in titre taking place. In this connexion little attention appears to have been devoted to the possible effect which the continued presence of the foetus might exert on the titre of the maternal antibody by acting as an absorbing agent. For this reason the following case seems worthy of record.

Mrs. W., Group O, Rh-negative rr. Mr. W., Group O, Rh-positive R_2R_2. *March 12, 1942:* Male full-term child, alive and well. Group O, Rh-positive, R_2r. *June 24, 1944:* Male full-term child, icterus gravis, died in a few hours. *Dec. 5, 1944:* Uterine bleeding, probably abortion. *March 1, 1945:* Abortion. *Aug. 1, 1945:* Abortion.

Aug. 10, 1946: Female child, caesarean section at 32 weeks, Icterus gravis. Transfused with Rh-negative blood. Died after twelve hours. Group O. Red cells inagglutinable by anti-D serum, presumably due to blocking effect of incomplete anti-D from mother's serum. Weakly agglutinated by rabbit anti-human globulin serum (Coombs *et al.*, 1946). Blood films frankly erythroblastic. Baby's serum gave positive blocking test. Antibody was not demonstrated directly by the conglutination method, but when the baby's serum was added to the first tube that showed no agglutination in a titration of the mother's serum by the conglutination method agglutination of Rh_2 cells resulted.

The mother's serum contained a weak antibody, complete anti-D, after the second pregnancy. The titre of this antibody fell after a few weeks. Her serum was first titrated by the conglutination method (Wiener, 1945) before the commencement of the last pregnancy. The titration figures given below suggest that the antibody titre was falling before pregnancy began. A rise occurred early in pregnancy, followed by a fall. This, we suggest, is probably due to the absorption of the antibody by the Rh-positive foetus. Pregnancy was terminated when the titre started to rise—that is, about the 32nd week. Delivery was followed by an immediate marked rise in titre.

Date	Titre Complete Anti-D	Titre Incomplete Anti-D
31/10/45	Nil	1 : 96
4/3/46	„	1 : 32
5/4/46	„	1 : 128
15/5/46	„	1 : 8
31/5/46	„	1 : 4
13/6/46	„	1 : 8
29/7/46	„	1 : 16
7/8/46	„	1 : 16, tr. 1 : 32
27/8/46	„	1 : 256
30/9/46	„	1 : 256

Our thanks are due to Dr. R. R. Race for genotyping Mr. W. and for confirming the presence of incomplete anti-D in Mrs. W.'s serum.

REFERENCES

Cappell, D. F. (1946). *British Medical Journal*, **2**, 641.
Coombs, R. R. A., Mourant, A. E., and Race, R. R. (1946). *Lancet*, **1**, 264.
Wiener, A. S. (1945). *J. lab. clin. Med.*, **30**, 662.

REPORT ON A CASE OF MELIOIDOSIS FROM SIAM

BY

J. P. J. PATON

Lieut.-Col., R.A.M.C.; Officer Commanding Medical Division of an Indian General Hospital, S.E.A.C.

C. R. PECK

Major, I.M.S./I.A.M.C.; Officer Commanding an Indian Field Laboratory, S.E.A.C.

AND

A. VAN DE SCHAAF

Captain, Dutch Army Veterinary Corps

The following account of a fatal case of melioidosis which occurred in a Dutch ex-P.O.W. in Siam may be of interest.

Clinical Notes

A Dutch infantryman, a former P.O.W., aged 46, was admitted to a combined Indian general hospital in Bangkok, Siam, on Nov. 6, 1945, with a complaint of weakness and fever.

Previous History.—He had been resident in various P.O.W. camps in Siam for just over three years, and in Nakom Patom, a town in Siam, for the last three months. On Sept. 25 he was admitted to a hospital in Siam with a diagnosis of pneumonia. Next day B.T. malaria parasites were found in the peripheral blood. The patient responded to treatment with sulphapyridine and combined quinine and mepacrine therapy, and by Oct. 10 the temperature was normal. Next day his temperature rose and he complained of fever and pains in the chest, especially on the left side. On Oct. 17 the white cell count was said to have been normal. Treatment with sulphonamides, penicillin, quinine, and mepacrine was tried with no obvious effect; the pyrexia continued, and he was admitted on Nov. 6 to the Indian General Hospital.

On admission he was pale, sallow, and undernourished. The tongue was dry and coated. There was no jaundice or any enlargement of the lymphatic glands. A slight tenderness was present over the caecum. The liver and spleen were not enlarged. The heart was within normal limits, and the sounds were pure and of moderately good tone. A few rhonchi were audible at the bases of both lungs. There was no paresis of the cranial nerves. The tendon reflexes were diminished. The genito-urinary system was normal.

On Nov. 8 the temperature was 102.4° F. (39.1° C.), pulse 116, and respirations 28. The tongue was moist and clean. There was no jaundice. Small palpable lymphatic glands in axillary and inguinal regions were noted. Abdominal examination disclosed no abnormality. The liver and spleen were not enlarged. The chest was clear and the heart was within normal limits, with sounds of poor tone, and rhythm grossly irregular (slow fibrillation). On examination of the nervous system the only points of interest were the inability to elicit knee-jerks and abdominal reflexes. The blood pressure was 105/70. The case was suggestive of "subacute bacterial endocarditis." Penicillin therapy was started, 40,000 units at once and 20,000 units three-hourly. On Nov. 13 the temperature was 103.8° F. (39.9° C.), pulse 120, and rhythm irregular. A few rhonchi were heard at both lung bases. The heart appeared enlarged to the right side. Pericardial friction sounds were not audible. Penicillin was stopped on Nov. 14 and sulphathiazole, 2 g. at once and 1 g. four-hourly, was given.

On Nov. 15 the fluoroscopical report was: "There is enlargement of the heart shadow, more marked on the right side. The apex beat is not very distinct. The left dome of the diaphragm is normal in shape and movements. The right dome of the diaphragm is not clearly visualized. Appearances suggestive of pericardial effusion." A pericardial puncture revealed no fluid. The pulse was now regular. Later the patient became breathless and there was dullness on percussion at the right base with crepitations. The liver was palpable (one finger). Pericardial puncture revealed no fluid. Penicillin, 50,000 units, was injected into the pericardial space. The blood pressure on Nov. 20 was 90/55. Next day the dullness persisted at the base of the right lung. Moist rales were heard over the middle and lower lobes of the right lung. On Nov. 27 he was given 40,000 units of penicillin three-hourly. Dullness at the base of the right lung, ? Grocco's triangle, was present on Nov. 30. No fluid present. On Dec. 2 the patient was still running a temperature, despite penicillin. The heart was enlarged to the right and left, the spleen was just palpable, and the liver was not enlarged. Screening showed a right interlobar collection of fluid. The blood pressure was 90/70. A radiological report of the chest on Dec. 6 was as follows: "There is a homogeneous dense shadow involving almost the whole of the right side of the thorax. The right costo-phrenic angle is completely obliterated. Fluid present." On the 7th the chest was explored, and 10 ml. of straw-coloured fluid was withdrawn for examination in the laboratory. The chest was again explored on the 9th, and 200 ml. of straw-coloured fluid was withdrawn. On Dec. 11 he had diarrhoea, six stools a day; a course of sulphaguanidine was started, but it had no effect on the diarrhoea. A therapeutic emetine course was started on the 14th. The stools contained *Ankylostoma duodenale*. Treatment was not possible because of the patient's poor condition. On Dec. 18 he became breathless; there was marked oedema of the feet and legs, and ? ascites. The urine was clear. "Mersalyl," 2 ml. daily until the oedema subsided, was prescribed. A generalized petechial rash appeared on the 19th, and the left knee-joint was hot and swollen (suggestive of septic arthritis). He was given penicillin, 40,000 units four-hourly, and sulphathiazole, 2 g. at once and 1 g. four-hourly. Nikethamide was to be given if necessary. The urine contained a few white blood cells and granular casts. On Dec. 20 the patient was moribund. The temperature was 97.4° F. (36.3° C.), pulse 140, and respirations 60. The oedema of the feet and legs and ascites had disappeared. The heart was enlarged to the right and left; the sounds were pure but of poor tone; the rhythm was regular. There was dullness over the base of the right lung posteriorly. Vocal resonance and fremitus were diminished. Breath sounds were not well heard. There were a few rales at the base of the left lung. Abdominal examination revealed no free fluid, but the tip of the spleen was palpable though not tender. The liver was not enlarged. The patient died at 4.40 p.m.

Laboratory Investigations

On Nov. 6 the white cells numbered 17,500 per c.mm. (neutrophil polymorphs 75%, eosinophils 2%, large and small lymphocytes 18%, large mononuclears 5%). The sedimentation rate (Westergren) was: 1st hour, 105 mm.; 2nd hour, 126 mm. On Nov. 20 a blood count showed: red cells, 3,060,000; haemoglobin, 50% (Sahli); white cells, 8,000 (neutrophil polymorphs 82%, eosinophils 2%, large and small lymphocytes 16%). On Nov. 27 the white cells numbered 11,200 per c.mm. (neutrophil polymorphs 81%, eosinophils 2%, large and small lymphocytes 14%, large mononuclears 3%). A blood count on Dec. 6 showed: red cells, 3,040,000; haemoglobin, 47% (Sahli); white cells, 11,800 (neutrophil polymorphs 81%, eosinophils 1%, large and small lymphocytes 16%, large mononuclears 2%). Malaria parasites were not found in peripheral blood smears taken on Nov. 9, 10, 13, 14, 24, 30, and Dec. 2. Examination of peripheral blood smears for *Spirochaeta recurrentis* was negative on Nov. 6. Blood cultures for enteric group and other organisms made on Nov. 6, 11, 21, and Dec. 19 were sterile after 14 days. The Widal and Weil-Felix tests revealed nothing of significance, and *Brucella abortus* was not found. Examination of urine on Nov. 6 and 15 showed: albumin, nil; sugar, nil; deposits, nothing abnormal. On Dec. 20 albumin and sugar were not present, but there were a few granular casts per field. Culture of midstream urine was sterile on Nov. 10 and 12. Faeces culture for the enteric group on Nov. 7, 13, and 18 revealed no pathogenic organisms. Examination of faeces for *Entamoeba histolytica* on Nov. 7 was negative. On Dec. 14 ova of *A. duodenale* were found. The sputum was negative for acid-fast bacilli when tested on eight occasions from Dec. 8 to Dec. 15. Examination of the pleural fluid showed: no cells or organisms in direct smear; culture, sterile; and guinea-pig inoculation for tubercle bacilli was negative.

Post-mortem Findings

A necropsy was performed (by C. R. P. and A. Van. de S.) one hour after death with the following results: *Central nervous system:* No macroscopical abnormality seen in skull, meninges,

or surface of brain. Cut sections of cerebral hemispheres, cerebellum, and brain stem disclosed no lesions. *Respiratory system:* Trachea and bronchi contained some fine frothy fluid. Left pleural cavity dry, and contained no adhesions. Right pleural cavity contained about 2 pints (1.14 l.) of straw-coloured fluid. Both lungs were crepitant, and on section revealed no lesions. Hilar glands appeared normal. *Cardio-vascular system:* Both layers of the pericardium were firmly adherent, completely obliterating the pericardial cavity. Heart normal in size. Myocardium pale and flabby. Valves were competent, and exhibited no lesions. Endocardium appeared normal. *Alimentary system:* Oesophagus, stomach, and duodenum presented no unusual features. Numerous abscesses, varying in size, were seen in the wall of the small bowel, at intervals of approximately 6 in. (15 cm.), from almost the commencement of the jejunum to about 3 ft. (90 cm.) from the ileo-caecal junction. No lesions were observed in the colon. The spleen was approximately three times enlarged; a cut section disclosed soft, dark-red pulp. The liver was swollen and pale; cut sections revealed no disturbance of the lobular pattern. The gall-bladder contained about 2 oz. (57 ml.) of clear bile. Nothing abnormal was seen externally and in cut sections of the pancreas. *Urinary system:* Both kidneys were enlarged and contained numerous small abscesses, particularly in the cortices. A number of these abscesses had coalesced to form a honeycomb appearance. The suprarenals appeared normal on external examination and in cut sections. Cultures on blood agar were made from heart blood, from the spleen, and from the abscesses in the bowel and kidneys. The same organism was isolated in each case.

Bacteriological Findings

(By C. R. P. and A. Van de S.)

The organism isolated presented the following features: Gram-negative rods, approximately 1 μ in length, showing some pleomorphism and bipolarity ("safety-pin" appearance). Actively motile. Aerobic. Grew easily on ordinary media. Growth in broth resulted in pellicle formation, with a ropy deposit in the depth of the medium and a peculiar aromatic odour. The pellicle became rough and wrinkled after four days. On nutrient agar button-like colonies, with flat rims, and central crater-like depressions developed. Growth on 5% glycerin agar was first of the mucoid type, but after three days developed the typical corrugated form of *Pfeifferella whitmori* (*Malleomyces pseudomallei*). Fermented lactose, glucose, mannite, dulcite, and saccharose, without gas formation. No indole formed from peptone water.

Animal Inoculation.—An adult male guinea-pig, inoculated intraperitoneally with 0.1 ml. of a faintly opalescent saline suspension of the organism, developed the typical "Strauss" reaction after 48 hours and died in four days. A post-mortem examination of the animal revealed: Both testicles were markedly swollen and inflamed. The tunica vaginalis was oedematous and haemorrhagic, and contained in the sac a small quantity of turbid fluid. Numerous miliary nodules were observed in the liver and spleen, in the omentum, and on the peritoneal surface of the bowel. Both lungs were congested. One small nodule was seen in the base of the right lung. The organism was recovered in pure culture from the heart blood and from the lesions in the liver and spleen.

Summary

A case of melioidosis diagnosed after death is described. The main clinical features were: slow fibrillation; pericarditis with effusion; pleural effusion; diarrhoea; septicaemia as evidenced by the petechial rash and septic arthritis; and embolic nephritis.

It is believed that this is the second case of melioidosis to have been reported from Siam.

We are indebted to the Director of Medical Services, A.L.F.S.E.A., for permission to publish this case, and to Dr. J. C. Cruickshank, of the London School of Hygiene and Tropical Medicine, for kindly confirming the organism as *Pfeifferella whitmori*.

Since the completion of this paper one of us (C. R. P.) has seen six other cases of melioidosis—one in Siam (reported on this page) and five in Rangoon. *Pfeifferella whitmori* was isolated post mortem in two cases and in the other four cases during life, from sputum, urine, and pus from an abscess in the neck.

A CASE OF MELIOIDOSIS PRESENTING AS AN ABSCESS IN THE NECK

BY

C. R. PECK

Major, I.M.S./I.A.M.C.; Officer Commanding an Indian Field Laboratory, S.E.A.C.

AND

T. ZWANENBURG

Lieutenant, Dutch Army Veterinary Corps

The following account of a case of melioidosis is considered worthy of publication.

Case Report

A havildar, aged 25, of the Royal Rajput Regiment, was admitted to an Indian general hospital (combined) in Bangkok, Siam, on Feb. 2, 1946, with a history of a swelling in the midline of the neck, just above the suprasternal notch. It started one month before, and when first observed by the patient the lesion was a small mass approximately ¼ in. (8 mm.) in diameter, to which he paid no particular attention. It grew slowly, and appeared to have caused no real discomfort. The swelling now was about 2½ in. (6.3 cm.) in diameter, and fluctuant. It was not particularly tender, and there was no erythema of the skin over it. There were no constitutional symptoms, fever, or glandular enlargements. The general condition of the patient was good. Similar swellings were not observed elsewhere on the body. There were no associated cases in his unit. The patient had been resident in Siam, just outside Bangkok, since August, 1945. The leucocyte count, both total and differential, presented no unusual features.

Progress.—The abscess was incised on Feb. 9, and a small quantity of a peculiar tenacious yellowish-brown pus evacuated. Microscopical examination of this material revealed 10 to 15 pus cells per field, amorphous debris, and scanty Gram-negative rods, about 1 μ in length, exhibiting some degree of pleomorphism and bipolarity ("safety-pin" appearance). Culture of the pus on blood agar resulted in a pure growth of *Pfeifferella whitmori* (*Malleomyces pseudomallei*), with features, and pathogenicity to guinea-pigs, as described below. Subsequent progress of the patient was slow, healing of the lesion appearing to be considerably delayed in spite of general surgical measures, antiseptic dressings, etc. It was therefore decided to try the effect of an autogenous vaccine from the strain isolated. This was accordingly prepared, at a strength of 500 millions per c.mm., and sterility proved, in liquid and on solid media and by intraperitoneal inoculation of an adult male guinea-pig. The initial dose administered subcutaneously to the patient was 0.1 ml. Subsequent doses were increased by 0.1 ml. every four days, until a maximum of 1 ml. had been reached. No untoward reactions, local or general, were experienced. After the first three or four doses the lesion began to show signs of acceleration in the rate of healing, and within one month the condition had completely subsided and the patient was discharged from hospital as "recovered," much pleased with the end-result. A sample of blood serum obtained before starting the vaccine course showed agglutinins to a titre of 1:80 against a killed suspension prepared from the organism isolated. Unfortunately, owing to our departure from the station and of the patient to his unit, contact was lost. His present condition is therefore not known, but efforts are being made to trace him. It was our intention to have estimated the agglutinin titre of this patient's serum on completion of the vaccine course, but, owing to an oversight and to the rush of work at that time, this unfortunately was not done.

Bacteriological Findings.—The organism exhibited the following features: Gram-negative rods, approximately 1 μ in length, showing some degree of pleomorphism and bipolarity, the latter being particularly well seen in smears from the original pus, and from the peritoneal exudate of an inoculated guinea-pig. Actively motile. Grew well on all ordinary media. Growth in broth resulted in pellicle formation on the surface, with a ropy deposit in the depth of the medium and a peculiar aromatic odour. After four days the pellicle became

rough and wrinkled. On nutrient agar, button-like colonies, with flat rims and central crater-like depressions, developed. Growth on 5% glycerin agar was first of the mucoid type, but after four days developed the typical corrugated form of *Pfeifferella whitmori*. Fermented lactose, glucose, mannite, dulcite, and dextrin, with production of acid but no gas. Liquefied gelatin. Milk clotted in four days. Indole-negative.

Animal Inoculation.—An adult male guinea-pig inoculated intraperitoneally with 0.1 ml. of a faintly opalescent saline suspension of the organism developed the typical "Strauss" reaction after 36 hours and died in 48 hours. Post-mortem examination of the animal disclosed both testes swollen and haemorrhagic, and some turbid fluid in the sac of the tunica vaginalis. Numerous miliary nodules were observed in the spleen, in the omentum, on the peritoneal surface of the bowel, and in the lungs. There was a large amount of free turbid fluid in the peritoneal cavity. The organism was recovered in pure culture from the heart's blood and from the lesions in the spleen.

Penicillin-sensitivity Tests.—The organism was found to be insensitive to penicillin in strengths of 5 and 10 units per ml. and even to 100 units per ml., using the half-plate, gutter, and agar-plate cup methods.

We are indebted to the Director of Medical Services, A.L.F.S.E.A., for permission to publish this paper, and to Dr. J. C. Cruickshank, of the London School of Hygiene and Tropical Medicine, for kindly confirming the organism as *Pfeifferella whitmori*.

Medical Memoranda

A Case of Scurvy

At least three points about scurvy require more investigation: (1) the part played by lack of vitamin P; (2) the minimum human requirements of vitamin C; and (3) the discrepancy between the anaemia found in severe scurvy and the lack of such anaemia in depleted volunteers. The following case throws some light upon these three points. Only essential details are presented.

CASE REPORT

The patient, a foundry worker aged 55, lived alone in a single room, with cooking appliances limited to a gas ring. He had eaten no potatoes for 30 years, and no green vegetables. He used to eat tinned tomatoes, till the entry of Italy into the war deprived him of his favourite brand. Every morning he had about a pound of oatmeal scalded in water, and with this he took what marmalade he could get (he estimated it as 2 lb. (0.91 kg.) a week). For the rest of the day he had bread and dripping, with which he consumed his meat ration. He worked hard and felt well until, about four weeks before admission, he injured both shins at work. This resulted in extensive bruising of both legs, accompanied by a severe pain which prevented sleep.

On admission to the Royal Infirmary, Sheffield, he exhibited very striking scorbutic phenomena—viz., typical scorbutic gums, purpuric rash on legs and arms, with follicular keratosis and haemorrhage, and very extensive bruising and swelling of both legs, worse in the left leg, where it extended from buttock to foot, with a knee-joint which was hot and grossly swollen. On March 29, 1946, a blood count showed: Hb, 42%, R.B.C., 3,000,000, W.B.C., 4,800, and serum bilirubin, 2.1 mg. per 100 ml. He was euphoric and slightly fatuous. There were, however, no signs of vitamin B deficiency. He was put on a sterilized milk diet, and care was taken to see that no unprescribed ascorbic acid reached him. He was given 20 mg. of ascorbic acid daily. On April 3 a definite improvement in the gums was already noticeable, and he made an uneventful recovery, apart from an attack of diarrhoea which began when his diet was increased after the fact of recovery was well ascertained. Before leaving hospital he was instructed in regard to his diet and was saturated with ascorbic acid. He was given 600 mg. of ascorbic acid daily, and after two days the excretion of 100 mg. daily was attained. His haemoglobin had reached 70% by May 20. No haematinic drugs of any kind were given.

CONCLUSIONS

A markedly haemorrhagic form of scurvy can occur in spite of the ingestion of apparently generous quantities of marmalade, and it can be cured without adding vitamin P.

If 20 mg. of ascorbic acid daily will cure a very severe case of scurvy it is legitimate to assume that the minimum requirements for health are not more than this, possibly less. Hence the prescription of ascorbic acid to people on ordinary diet is a waste of very precious material.

The swelling of the legs was probably largely due to haemorrhage, which caused the anaemia. This view is supported by the high bilirubin content of the serum and by the satisfactory recovery without haematinic drugs, the blood being reabsorbed and refashioned.

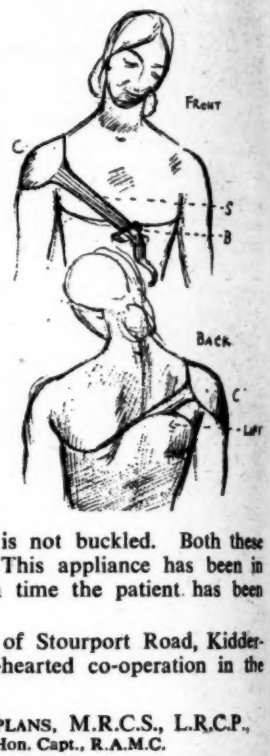
This method of treatment was undertaken to test the reliability of the conclusions drawn from a recent M.R.C. experiment. Undoubtedly the safest means of treating true scurvy is by immediate saturation with ascorbic acid.

My thanks are due to my clinical assistant, Dr. C. E. Davies, my house-physician, Dr. Horne, and Sister Taylor for the many observations and the care taken in what was a very responsible experiment.

A. E. BARNES, M.B., F.R.C.P.

Recurring Spontaneous Dislocation of the Shoulder-joint treated by an Appliance

The patient, a frail old lady of 83, was first seen by me a year ago. She had been suffering from recurrent dislocations—these sometimes occurring twice a month. The dislocations had to be reduced under an anaesthetic, and the shock and pain were putting her on the down-grade.



In view of her advanced age and poor health the drastic operation was considered too risky, so I had built the corset and shoulder "cup" (C) here illustrated. My corset-maker tells me the style of make and material is "broché." I had the corset lifted over the scapula on the affected side, the "lift" being well over an inch (2.5 cm.), as shown in the back view. There is no lift in front. The "cup" is fitted over the round of the shoulder and is made of a firm webbing. The front view shows the "cup" attached by a webbing strap which passes across the chest and through a buckle (B), so that the pull on the shoulder can be varied. At the back the "cup" is attached by a strap to the corset at the middle. It is not buckled. Both these webbings are elastic in nature. This appliance has been in use for 4½ months, during which time the patient has been free from the dislocations.

I am indebted to Mrs. Dixon, of Stourport Road, Kidderminster, for her skill and whole-hearted co-operation in the making of this appliance.

ERIC COPLANS, M.R.C.S., L.R.C.P.,
Hon. Capt., R.A.M.C.
Kidderminster.

The Rt. Hon. R. A. Butler, M.P., was elected first president of the newly formed National Association for Mental Health at its inaugural meeting in London on Feb. 11. The Duchess of Kent has consented to be Patron, and the Earl of Feversham was elected chairman, Lady Norman, vice-chairman, and Sir Otto Niemeyer, honorary treasurer. The Association results from the amalgamation of three leading voluntary mental health bodies, the Central Association for Mental Welfare, the Child Guidance Council, and the National Council for Mental Hygiene, as recommended by the Feversham Committee on Voluntary Mental Health Services. The work of the amalgamated bodies in providing medical, educational, and social services complementary to the Statutory Services will be carried on and greatly extended in close co-operation with the Government and local government authorities concerned. The new association has been entrusted with the organization of the International Congress on Mental Health to be held in London next year.

Reviews

GYNAECOLOGICAL DIAGNOSIS

Lehrbuch der gynäkologischen Diagnostik für Ärzte und Studierende. By Prof. Dr. W. Neuweiler. (Pp. 474; illustrated. Swiss francs 58.) Berne: Medizinischer Verlag Hans Huber.

Neuweiler's *Textbook of Gynaecological Diagnosis* must, without doubt, be regarded as one of the most important contributions to gynaecological literature in the last twenty years. Neuweiler has been able to condense into some four hundred and fifty pages a description of most of the modern methods of gynaecological investigation and diagnosis. The volume is well illustrated with some excellent photographs.

The modern methods of investigation are described in detail and great stress is placed on hysterosalpingography. The danger of insufflation is emphasized, and Neuweiler maintains that only carbon dioxide should be used. An excellent photograph of the space between the liver and diaphragm after successful insufflation is included. A good account is given of the different types of vaginitis, some of which are not well known in this country. The classification and description of irregular uterine haemorrhage follow the German system, with no mention of chronic subinvolution and little attention paid to chronic metritis. The sections on carcinoma of the uterus are extremely good, with some pertinent illustrations of the metastases. An illustration is given of the histology of psoriasis uteri. Dysmenorrhoea is considered in some detail and by an approach rather different from that in this country. The section on ovarian tumours is of very great value. The most disappointing section is that on sterility, which is too condensed. It is hoped that the book will receive attention from gynaecologists over here, for there is much to be said for being familiar with the Continental method of approach to the practice of gynaecology.

MEDICAL LECTURES FROM PARIS

Clinique et Investigations. By Noël Fiessinger. (Pp. 831; 192 figures. 750 francs.) Paris: Masson et Cie. 1946.

Hépatites Rares. By Maurice Loeper. (Pp. 216. 290 francs.) Paris: Masson et Cie. 1946.

The first of these two books is on the relation between clinical medicine and special investigations. The author is a professor of medicine in Paris and well known for his work on the liver and the blood. The subject matter consists of about fifty clinical lectures, grouped in six sections according to the importance of the special investigations in the management of the cases described. The lectures have been chosen to illustrate the varying role played by the laboratory in the management of patients. While diagnosis may often depend entirely on radiological or laboratory data, at other times investigations are merely an aid or a guide in the management of the case, and they may even be misleading. The last two sections of the book give instances where investigations gave no help, either because a purely clinical diagnosis was possible or because diagnostic mistakes occurred in spite of the full use of laboratory methods. The subdivision is, of course, artificial and the classification often arbitrary, and not all the lectures fit easily into the scheme of the book. Conceived in this way, the book provides only an incomplete account of the interpretation of laboratory methods, and that not up to date, since many of the lectures were given in 1941.

The general theme is that though laboratory results may be obtained with scientific precision, their application to clinical problems is rarely simple and their value depends entirely on the clinical context. That this fact has not always been appreciated is shown by the changing fashions in application of particular tests, and the author gives a good account of the long time it has taken for such tests as the estimation of the blood urea in nephritis or of the blood cholesterol in cholelithiasis to be given their proper significance. Every new discovery in diagnostic methods appears to suffer a period of unwarranted popularity before knowledge of its limitations becomes sufficient to make interpretation safe, and the author believes it takes twenty years to prove the value of a new test. The book is long, and each lecture includes detailed case reports and often discussions on aetiology, pathology, and treatment. As is common in French writings, theoretical speculation, particularly on pathogenesis, is allowed more scope than seems justified by the evidence, but diagnosis is based on careful observation and logical deduction. The lectures cover a wide variety of diseases, and the selection of topics has depended on the available clinical material, so that rarities such as chloroma are dealt with as fully as gastric ulcer and myocardial infarct. Many common conditions receive no mention. Cirrhosis of the liver and gout are considered in full detail. Two lectures give interesting information on the medical aspects of famine in Paris during the German occupation—that on "Anémies Erythro-plasmatiques," which includes a study of oedema formation in relation to plasma-protein changes in these patients, and that on hypoglycaemic coma due to starvation. The informal style appropriate to the lecture theatre in which the book is written adds considerably to its length. There is no index, and references are few and mainly to the French literature.

The second book comprises a series of twenty-one clinical lectures by a professor in charge of a medical clinic in Paris. The first five lectures deal with sulphur metabolism, oxaluria, oedema, osteomalacia, and anaemia in disease of the liver. The remainder are entirely clinical, and deal with uncommon topics such as the changes in the liver in tuberculosis or death from haemorrhage into a carcinoma of the liver. The choice of subjects has been determined by the accidents of the clinic and there is no general theme or design. Statements appear to be based on a few cases, and there is no background of collected and analysed material. The few references are to French authors, and there is no index. It is difficult to imagine an English or American professor writing such a book, difficult too to imagine many English-speaking people wishing to read it. Clinical medicine, like patriotism, is not enough, and the day of the elegant series of clinical lectures is gone. We may regret the passing of good showmanship in the out-patient department, the charm of eloquence in the lecture-room, and the elegant phrase in writing, but as we learn more about disease in animals and man, and as the total number of scientific workers increases, it becomes essential to present our knowledge in a different form. To-day is the day of the monograph and the review.

TREATMENT OF FRACTURES

The Management of Fractures, Dislocations, and Sprains. By John Albert Key, B.S., M.D., and H. Earle Conwell, M.D., F.A.C.S. Fourth edition. (Pp. 1,322; 1,316 illustrations. 63s.) London: Henry Kimpton. 1946.

The third edition of this book was favourably noticed in our columns in August, 1943 (p. 169), comment being made on the revision of the chapter on compound fractures necessitated by the introduction of the sulphonamides. Further revision of this section has now been carried out, and the present edition incorporates this along with what has been learnt from war experience in the treatment of skeletal injuries, vast numbers of all varieties of which were of course provided by the carnage which then took place. As might be expected the principal changes in the book are in sections on the spine and hip and those dealing with compound injuries. One chapter entitled "First-aid in Fractures and Automobile Injuries" should serve a very useful purpose. Many of these injuries occur at some distance from a hospital, and as a result doctors who do not usually practise surgery may be called upon to render first-aid. Unfortunately the Thomas arm and leg splints, so valuable in such accidents, are but rarely available in doctors' surgeries, and so first-aid measures have to be adapted to the available apparatus—usually boards, bandages, cloth, and padding—and it is with the use of such materials that this chapter deals. Part II of the book, which covers the diagnosis and treatment of specific injuries, remains one of its most attractive features, and the article on fractures of the spine is particularly well written and illustrated.

This book should continue to be an authoritative and highly practical guide to students and practitioners, and we foresee that the new edition will be as popular as those preceding it. It can confidently be recommended as a comprehensive account of the commoner skeletal injuries and their modern treatment,

and we can write of this edition as we did of the third. We have the highest praise for it and we thoroughly recommend it to surgeons and practitioners everywhere.

OESTROGENS AND PROSTATIC HYPERTROPHY

The Internal Secretion of the Germinal Tissue of the Testes and Prostatic Hypertrophy. By Nils Törnblom. Uppsala: Almqvist and Wiksells Boktryckeri—A—B. (Pp. 106. Price not stated.)

The experimental work here described by Dr. Törnblom was noticed in an annotation in the *Journal* (Dec. 9, 1944, p. 759). The author discusses the hormonal activity of the testes largely, though not solely, from the point of view of prostatic hypertrophy. It will be recalled that according to the earlier hypothesis of Lower a hormone other than testosterone is normally secreted by the testicles. The decrease in its secretion in later years causes an increased secretion of gonadotrophin, just as in the ovarian failure of elderly women. The gonadotrophin, acting on the still functional cells of the testicles, gives rise, according to this hypothesis, to an increased output of testosterone and thus to prostatic enlargement. A second hypothesis is almost the opposite of Lower's. It assumes that in old men the output of testosterone is diminished and that the prostatic enlargement is due to the unopposed action of the oestrogens normally present even in the male.

In an attempt to settle this controversy Törnblom planned and executed the experiments here described. They demonstrate that the germinal epithelium of the prostate produces an oestrogenic hormone which is probably oestradiol. Valuable as this information is, it leaves the original question unanswered. Dr. Törnblom uses his experimental results as evidence in favour of Lower's hypothesis, but it can easily be seen that they support equally well the contrary proposition. Nevertheless, the book is a clear exposition of a series of valuable experiments beautifully planned and executed.

STANDARDIZATION IN HAEMATOLOGY

Haematological Technique. By Drs. L. Everard Napier and C. R. Das Gupta. Third edition. (Pp. 128. Rs. 8.) Calcutta: U. N. Dhur and Sons. 1945.

This little book contains an account of the routine methods for the investigation of anaemia used at the Calcutta School of Tropical Medicine. The authors stress the advantages of examining venous blood and of recording haemoglobin in grammes per 100 ml. The techniques are well selected, and they are fully and clearly described. If they become standard practice throughout India, as the authors hope, haematology there will be accurate and up to date. Whatever the case in other fields of medicine, in haematology accuracy and standardization are preferable to personal choice and variety. The first two editions of this book were rapidly exhausted, and the same will probably be true of the third. In a fourth edition we suggest that something should be said about plasma jaundice and rather more about the Rh factor. Furthermore, as the inexperienced are apt to lay too much stress on differences between successive counts or apparent departures from the normal, a chapter might be devoted to the simple statistics of blood counting, indicating the margin of error of the various techniques.

A second edition of Dr. E. B. JAMIESON'S *Illustrations of Anatomy for Nurses* has now been published in a new form of binding, which can be opened out flat or folded over completely so as to show any particular plate as a single sheet. It consists of 64 coloured plates, the majority of which have been selected from the author's well-known *Illustrations of Regional Anatomy*. Certain changes have been introduced in the way of improvements in the colour-blocks and by the addition of new distinctive coloration—e.g., purple to distinguish the portal from the systemic venous system, which is represented blue. Great pains have been taken also to render the indicating-lines distinct, so that their course over a darkly coloured area can easily be followed; and an index of the names employed has been added, so that many of the abbreviations used in the plates can be easily recognized by beginners, and the particular plates in which the objects are named readily found. This new edition will no doubt achieve an even greater popularity than the first and be a great help to nurses, who in their study of anatomy have little opportunity of seeing or handling dissected parts. It is published by E. and S. Livingstone, of Edinburgh, at 8s. 6d.

BOOKS RECEIVED

[Review is not precluded by notice here of books recently received]

Pharmaco-Therapeutic Notebook. By H. W. Tomski, M.P.S. (Pp. 280. 15s.) London: Baillière, Tindall and Cox. 1946.

A summary of pharmaceutics intended for pharmacists, medical students, and general practitioners.

Stedman's Practical Medical Dictionary. By N. B. Taylor, M.D., F.R.S.(C.), F.R.C.S.Ed., in collaboration with A. E. Taylor, *D.S.O.*, M.A. Sixteenth edition revised. (Pp. 1,291. 42s.) London: Baillière, Tindall and Cox. 1946.

The new edition of this well-known dictionary contains an etymological section besides many other additions.

1946 Year Book of Eye, Ear, Nose and Throat. By L. Boshman, M.D. (The Eye), S. J. Crowe, M.D. (The Ear, Nose, and Throat), with the collaboration of E. W. Hagens, M.D. (Pp. 543. $3.75 or 21s.) London and Chicago: H. K. Lewis and The Year Book Publishers. 1947.

Covers recent advances in ophthalmology and the E.N.T. specialty.

The Doctor and Tomorrow. By Arthur E. Brown, M.B., B.Ch., F.R.A.C.S. (Pp. 136. 3s.) Sydney: F. H. Johnston. 1946.

The author discusses the future of medical practice in Australia, with particular reference to giving the whole population an adequate medical service.

Recent Advances in Clinical Pathology. By various authors. Editor: S. C. Dyke, D.M., F.R.C.P. (Pp. 468. 25s.) London: Churchill. 1947.

This book covers recent additions to the practice of clinical pathology in Great Britain.

A Textbook of Midwifery. By Wilfred Shaw, M.D., F.R.C.S., F.R.C.O.G. Second edition. (Pp. 649. 21s.) London: Churchill. 1947.

To this edition has been added new work on the Rh factor and erythroblastosis and on chemotherapy.

The Psychoanalytic Theory of Neurosis. By Otto Fenichel, M.D. (Pp. 703. 35s.) London: Kegan Paul, Trench, Trubner. 1946.

The author claims to present the psycho-analytic doctrines in a systematic and comprehensive manner. Part I includes an account of medical development, Part II that of the psycho-analytic theory of neurosis.

Mothercraft in the Tropics. By K. Macpherson. (Pp. 205. 6s.) London: Cassell. 1947.

Instruction on the problems of mothercraft and minor ailments in childhood for those living in the Tropics; for the layman.

The Acute Infectious Fevers. By A. Joe, *D.S.C.*, M.D., F.R.C.P.Ed., D.P.H., D.T.M.&H. (Pp. 276. 18s.) London: Churchill. 1947.

An introduction to the subject for students and medical practitioners.

Die Hormonversorgung des Foetus. By J. Samuels. (Pp. 320. No price.) Leiden: Brill. 1947.

An account of the ovarian and gonadotrophic hormones in pregnancy. Written in German with a summary in English.

Materia Medica for Nurses. By W. Gordon Sears, M.D., M.R.C.P. 2nd ed. (Pp. 246. 5s.) London: Edward Arnold. 1947.

Includes besides materia medica accounts of toxic effects of drugs, the use of hormones, vaccines, and vitamins, and tables of doses.

Pellagra in the Oto-Neurology and Rhino-Laryngology. By Otto L. E. De Raadt, M.D. (Pp. 172. No price.) Leiden: University Press. 1947.

Based on experience acquired when a prisoner of war of the Japanese. In English.

Human Genetics. Vols. 1 and 2. By R. R. Gates, D.Sc., Ph.D., F.R.S. (Pp. 742 and 1,518. £5 for 2 vols.) New York: Macmillan. 1946.

The author's previous work is gathered together in these volumes and much new material added. Intended as a source book for all concerned with the genetic aspects of medicine or anthropology.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY MARCH 15 1947

PRESSURE AT THE CERVICO-BRACHIAL OUTLET

It is probably fair to say that the causes of backache with or without pain radiating along the course of the sciatic nerve can nowadays be determined with reasonable accuracy. This is not to say that the problem of deciding what in every case is the best remedy has by any means been solved, particularly when the lumbago-sciatica syndrome is due to a lesion of an intervertebral disk. Nevertheless a very great measure of agreement has been reached about the pathology and the treatment of this type of pain in the lower limb. There is still widespread controversy, however, about the causes and the methods of treatment of pain in the upper limb. At one time a cervical rib, or its equivalent, helped by aberrations in the derivation of the brachial plexus was the sole explanation. If no rib or enlarged seventh cervical transverse process was present few surgeons had sufficient courage or conviction to explore the posterior triangle of the neck in search of a fibrous band over which the brachial plexus and perhaps the subclavian artery might be stretched. The unfortunate patient had usually to resign himself to a vague and unsatisfactory diagnosis of neuritis, neurosis, malingering, or fibrositis. The diagnosis of "fibrositis" often had the most serious consequences for the patient. It initiated a regime of treatment beginning with the ruthless eradication of "septic foci," as often as not more imaginary than real, and proceeding through all the currently fashionable forms of physical treatment.

Pain in the upper limb has increasingly affected middle-aged and elderly women during and since the war. Cervical ribs could not be the only explanation if for no other reason than that the syndrome of pain in the shoulder radiating down to the hand is common while cervical ribs are rare. Attention has been concentrated on the possible causes of pressure on the brachial plexus or its roots other than from an accessory rib. Just as our knowledge about sciatica has been increased by anatomical and pathological studies of the lumbar intervertebral disks, so also has "brachial neuritis" been illuminated by similar studies of the cervical disks and the intervertebral foramina.[1-5] Diminution in the calibre of a foramen by a prolapsed disk, by osteophytes, or by recurrent subluxation of one vertebra on another, is quite often accompanied by pressure on the corresponding nerve root. Gross involvement of a root, usually the seventh or the sixth, is easily recognized, but minor degrees give rise to symptoms not so readily distinguishable from those caused by pressure on or stretching of the brachial plexus.

Once clear of the spinal column, the nerves have to run further hazards in their journey to the axilla. For most of the way they are accompanied closely if not intimately by the main vessels to the limb so that the clinical picture to which pressure gives rise may be a mixture of neurological and vascular signs and symptoms. The circulatory changes vary greatly in degree. Most commonly the whole hand tingles or goes to sleep; it feels numb or cold to the touch, and it appears blue or pale in colour. At the other end of the scale there is obliteration of the radial, ulnar, and part of the brachial pulse with gangrene of one or more fingers. The risks to which the neuro-vascular bundle is subjected are those of pressure, stretching, and friction. Complaints of tingling, burning pain, and numbness and coldness in the fingers are nowadays common among middle-aged and elderly women. There seems little doubt that fatigue, unaccustomed manual work, and the many hours spent in carrying shopping baskets result in atony of the shoulder girdle, drooping of the shoulder, and stretching of the plexus over the first rib or the anterior edge of the scalenus medius. It has been well known for years that rest followed by graduated exercises to restore the tone and power of the shoulder girdle muscles will often relieve symptoms even when a cervical rib is present.

Anatomical variations in the pathway of the vessels and nerves are an obvious source of pressure or stretching effects. This pathway—the cervico-brachial outlet or tunnel—can be altered in shape and in capacity by a number of factors. It is continually altering with movements of the shoulder and arm. Accessory ribs may be present—the classical cervical rib first noted by Galen and later by Vesalius and so admirably described in the present century by the anatomists Wingate Todd, Wood Jones, and Stopford, and by surgeons, notably Sargent and Telford.[6 7] The floor of the cervico-brachial tunnel is formed by the upper thoracic outlet, which may be asymmetrical, tilted, and higher than normal because of lateral curvatures of the spine or because of maldevelopment of the first rib, varying from rudimentary forms to alterations in the shape and curve of the so-called normal. The potentialities for the exercise of a stretching effect are thus numerous. It is also claimed that these structural anomalies of the upper thoracic outlet cause narrowing of the space between the clavicle and the first rib so that the neuro-vascular bundle can be nipped between the two bones when the limb is in certain positions.[8-10]

The anterior and the medial scalene muscles play a part in the production of this syndrome. It may well be that more than these two are concerned. The firm and rather sharp anterior border of the scalenus medius is a ridge over which the plexus can be stretched, particularly if the muscle attachment is carried unusually far forward on the first rib. The scalenus anticus forms an angle with the first rib—the costo-scalene triangle in which lie the subclavian artery and the lower components of the brachial plexus. Because of spasm and subsequent hypertrophy the spastic thickened anterior scalene narrows the costo-scalene

[1] *J. Bone Jt. Surg.*, 1932, **14**, 877.
[2] *Sth. med. J.*, 1942, **35**, 663.
[3] *Ann. Surg.*, 1937, **106**, 428.
[4] *J. Amer. med. Ass.*, 1943, **121**, 1209.
[5] *Surg. Gynec. Obstet.*, 1944, **78**, 350.
[6] *Proc. roy. Soc. Med.* (Clin. Sect.), 1913, **6**, 117; *Brain*, 1921, **44**, 95.
[7] *Brit. J. Surg.*, 1919, **7**, 168; 1931, **18**, 557.
[8] *Lancet*, 1943, **2**, 539.
[9] *Clin. Sci.*, 1934, **1**, 327.
[10] *Brain*, 1944, **67**, 141.

triangle and thus compresses its contents against the first rib.[11-13] How spasm of a single muscle arises in patients in whom fatigue and general muscular atony are otherwise outstanding features is not very clear. The suggestion is made that any painful condition in the area supplied by the fourth, fifth, sixth, and seventh cervical nerves, which also supply the scalenus anticus, may initiate a reflex spasm. Walshe[10] and his co-workers stress the importance of wear and tear of the soft tissues in the cervico-brachial tunnel. They point out that the unceasing respiratory movement of the thorax and the frequent arm and shoulder movements of everyday life cannot but aggravate existing maladjustments between arteries, nerves, and bones. This oft-repeated friction, stretching, and compression of soft tissues may lead to considerable reactionary tissue change. Thus the walls of the subclavian artery may become worn, and the artery may be bound to the first rib by scar tissue, which can also drag on the nearby stellate ganglion, already tethered to the artery by the annulus of Vieussens, thus perhaps explaining the sympathetic phenomena occasionally encountered.

These various conceptions of the hazards which determine stretching, pressure, or friction effects on the neuro-vascular bundle may be summarized briefly as physiological (muscle atony and drooping shoulder), anatomical (anomalies of bone and muscle attachments), and pathological (reactionary soft tissue changes). While it is not difficult to understand how the nerve trunks are usually involved the mechanism of involvement of the main vessel to the limb is by no means clear. At first it was thought that the circulatory disturbances were caused by stretching or kinking of the subclavian artery over the abnormal rib, or by thrombosis within the artery, or by a combination of these factors.[14] Later Todd, Telford, and Stopford claimed that all the vascular changes could be explained by pressure or friction on the sympathetic fibres which enter the arm in the lowest trunk of the plexus and which are occasionally situated in that part of the trunk in contact with the rib. These fibres are distributed to the peripheral vessels at various levels. Irritation of them, as by friction on a rib, induces spasm of the arterial wall, obliteration of the vasa vasorum, and eventually such changes in the health of the vessel wall as to lead to thrombosis and occlusion. In support of this hypothesis is the clinical observation that thrombosis does not extend higher than the level of the pectoralis major tendon, the axillary and subclavian arteries being innervated by a periarterial plexus not subjected to friction and not, like the brachial, radial, and ulnar arteries, by branches from the cerebrospinal nerves.

These views have been severely criticized by Lewis and Pickering in 1934,[9] by Falconer and Weddell in 1943,[8] and more recently by Walshe[10] on the grounds that the anatomy of the sympathetic supply to the upper extremity is not as described by Todd, Telford, and Stopford; that long-standing irritation of sympathetic fibres should, as happens in somatic nerves subjected to similar trauma, lead to structural impairment and paralysis with vasodilation, increased warmth and redness of the limb, and loss of sweating; and that, even assuming a particular topographical arrangement of the sympathetic fibres, it is difficult to understand how recurrent pressure over long periods can disturb sympathetic fibres only in some cases and somatic fibres only in others. These writers suggest that momentary obliteration of the artery in certain movements of the shoulder would account for these so-called vasomotor symptoms and would explain also their momentary duration and their fluctuation. The artery is thought to be nipped between the clavicle and the abnormal rib. Constant repetition of this nipping damages the vessel wall and results in dilation, aneurysm, thrombosis, and periarterial fibrosis. Costoclavicular compression is thus held to account for many of the pressure effects associated with cervical, rudimentary, and even normal first ribs in relation to both nerves and vessels. It is considered the cause of obliteration of the pulse when traction is exerted on the dependent arm and when the arm is elevated. Evidence to support its occurrence has been adduced from venograms, and it has been seen to occur at operation.

The conception of costoclavicular compression as a common cause of either nervous or vascular pressure effects is powerfully challenged by Telford and Mottershead elsewhere in this issue in an article (p. 325) which is a model of careful, painstaking, and patient observation. They base their views on the findings at 120 operations for the relief of pressure on the neuro-vascular bundle of the arm; on the effects of posture of the arm and shoulder girdle on the radial pulse in 120 medical students; and on the evidence obtained by the dissection of 30 cadavers. The characteristic thoroughness of observation at this large series of operations (in only five of which no adequate cause was found) and the careful examination of controls both living and dead give great weight to their conclusions. Telford and Mottershead agree that in a small proportion of cases the clavicle can compress the neuro-vascular bundle against the scalenus medius or an accessory or abnormal rib, but only with the shoulder forcibly retracted backwards or the arm fully elevated. In other positions they regard the idea of costoclavicular compression as "pure supposition unsupported by any anatomical evidence." Depression of the shoulder by traction on the dependent arm may obliterate the radial artery, but it does not obliterate the first stage of the axillary artery. It is clear then that the clavicle is not the compressing agent. The point is further made that when the shoulder is depressed the clavicle moves downwards and forwards so that the costoclavicular space is widened, not narrowed. The compression occurs distal to the clavicle and is considered to be due to an anatomical disposition of the axillary artery in some individuals—perhaps a majority—which allows it to be squeezed between the lateral and medial heads of the median nerve when the shoulder is depressed. Symptoms referable to the plexus with the arm in this position are caused by stretching of the plexus over an accessory rib, an abnormal first rib, or the anterior edge of the scalenus medius. The lack of reference to the scalenus anticus is of interest in view of the fact that it has often been regarded as a causal agent in America and at one time in this country.

[11] *Ann. Surg.*, 1927, **85**, 839.
[12] *Amer. J. Surg.*, 1935, **28**, 669.
[13] *Folia Neuropathol. Estoniana*, 1931, **11**, 93.
[14] *Amer. J. med. Sci.*, 1907, **133**, 173.

This paper marks another welcome step forward in the elucidation of causes of pressure at the cervico-brachial outlet. The authors emphasize, as indeed do nearly all recent writers, that no one mechanical cause can explain all cases. It is possible moreover that there are a number of factors responsible in every case. Obviously, therefore, no one method of treatment, and particularly no one operation, is applicable to all patients. If the symptoms do not settle with rest and simple conservative measures and remain sufficiently disabling, operation is justifiable. There is much to be said for an exploration as thorough as Telford's so that the precise cause of the pressure on nerve or artery can be seen and dealt with appropriately. In this way disappointments from operations applied as a routine to all patients would be avoided. Division of the anterior scalene is a temptingly easy procedure. But the results of this operation are almost as uncertain as the aetiological role ascribed to this muscle. Furthermore, adequate exposure and careful demonstration of the site of the pressure might prove it often unnecessary to do more than divide part of the medial scalene, which is a formidable enough operation, rather than resect part of the first rib.

The briefest survey of the literature reveals the complexity of the problem and the variety of factors responsible for pain radiating down the arm from the neck and shoulder. Nowadays it should be possible to decide before treatment whether the site of nerve constriction is within or without the spinal column. It is perhaps wise to stress the need for careful clinical examination and for comprehensive radiography of the cervical spine and shoulder girdle. It may well be that venograms will prove an increasing help. Much remains to be solved, particularly about the aetiology of vascular thrombosis and the mode of involvement of the sympathetic nervous system, on neither of which points is much said in this paper. It is to be hoped that Prof. Telford and his co-workers will be able to throw further light on these still dark corners of a subject which he and his Manchester colleagues have done so much to illuminate now and in the past.

WATER AND SALT DEPLETION

Ninety years ago it seemed certain that Virchow's doctrines had driven the last nails into the coffin of humoral pathology. The cell was the unit, and in cellular changes, revealed by the microscope, all the secrets of disease were held to repose. Physiologists, led by Claude Bernard, were the first to appreciate again, and in a more precise sense, the importance of the fluids which bathe the cells. With the growth of biochemistry a new humoral pathology has arisen, in which water, the electrolytes, and the plasma proteins have replaced the four humours. In H. L. Marriott's Croonian Lectures, the third of which is published in this number of the *Journal*, this new humoral pathology is expounded with a welcome lucidity. It is remarkable that the metabolism of water, which constitutes 70% by weight of the human body, should have been so long neglected. It is only of recent years that its importance has come to be appreciated in clinical medicine; "dehydration" has now become a popular term, and its alleviation is pursued with an enthusiasm not always illuminated by a knowledge of the subject's complexities.

The body's water is distributed between two great compartments: the intracellular and the extracellular. The last includes both that within the vessels and that in the tissue interstices. Between these two compartments osmotic equilibrium is maintained chiefly by the electrolytes: within the cells, potassium and phosphate are the most important ions; without, sodium and chlorine. Although water can diffuse freely through the cell membrane, it is impermeable to the electrolyte ions. Dehydration may be either cellular or extracellular. The first arises when the body is depleted of water without loss of electrolytes; the osmotic pressure of the extracellular fluid rises and water passes out from the cells until equilibrium is restored. In the second, loss of extracellular electrolytes diminishes the tonicity of the fluid in this compartment; renal excretion of water proceeds until osmotic balance is again approached, reducing in consequence the total volume of extracellular fluid. Marriott prefers to speak of the first as "pure water depletion," and the second as "pure salt depletion"; he has stressed the immense importance to the clinician of the distinction between the two. Cellular dehydration follows deprivation of water, either because it is not available, or because it cannot be swallowed, or because physical weakness is so extreme that the patient is incapable of slaking his thirst. Its development may be accelerated by defective renal function necessitating the excretion of a dilute urine. Extracellular dehydration is the consequence of the increased loss of sodium chloride in a patient whose intake of water is sufficient to compensate for that transporting the lost salt. Such losses are the result of the removal or expulsion of what Burton called "excrementitious humours of the third concoction": sweat, saliva, gastric juice, bile, and pancreatic and intestinal juices. Sweating, vomiting, and diarrhoea account for most cases; but "removal" is added advisedly, for the gastric suction so frequently employed after abdominal surgery can lead to rapid depletion. For pure extracellular dehydration to occur the lost water must be replaced. In cellular dehydration thirst and oliguria are the clinical features; the urine contains normal or increased quantities of sodium chloride. In extracellular dehydration the clinical picture is more complex. There is no thirst; the urinary volume is normal, but, except in Addison's disease, sodium chloride is absent; cramps are common, and such accompaniments of a reduced plasma volume as syncopal attacks, hypotension, and haemoconcentration make their appearance early and progress until peripheral circulatory failure closes the scene. Cellular and extracellular dehydration may occur separately, but it is by no means rare for them to be combined in the same patient.

There is substance in Marriott's criticism of the term dehydration, and good reason for using, as he suggests, labels denoting the underlying causes. But in these new terms there is some danger, perhaps, of these states acquiring the dignified status of "syndromes." It cannot be too greatly stressed that they are dynamic perturbations of the body's chemistry which may arise not only in the simple conditions cited but in circumstances of far greater complexity. The appreciation of the events which may lead to

salt and water depletion is as important as the ability to recognize the developed disturbances, because in many instances preventive treatment can and should eliminate their occurrence. In this country the problems are more difficult than in the Tropics, where profuse sweating and choleraic diarrhoea are such obvious causes. In temperate climates water and salt depletion appear frequently during the course of disease-processes which may themselves seem to offer sufficient reason for the patient's deterioration. Their detection in these circumstances will tax the most careful clinician. The fundamentals of treatment are simple : to replace water where water is needed ; and salt, where salt. The quantitative aspects are more difficult but none the less important ; on this subject, and on the routes by which fluid may be administered, Marriott gives much sound and practical advice. It is to be hoped that his admirable lectures will help to convince those physicians and surgeons who still require convincing that the day-to-day problems of water and salt metabolism are of such importance to their patients that their management should not be left in the hands of house officers and nurses.

MELIOIDOSIS

Melioidosis is a disease which is almost always fatal and is seldom correctly diagnosed during life. Two cases in Allied soldiers in the Far East are described in this issue by Paton, Peck, and Van de Schaaf (p. 336) and by Peck and Zwanenburg (p. 337). Melioidosis,[1] which was first described in 1912 by Whitmore and Krishnaswami[2] in Rangoon, was later recognized in Kuala Lumpur as an epizootic disease of small laboratory animals by Stanton. The occurrence of human cases in the Federated Malay States, the isolation and further description of Whitmore's bacillus, and the reproduction of the disease in laboratory animals were detailed in the classical monograph by Stanton and Fletcher in 1917.

As its name indicates, the manifestations of melioidosis frequently resemble those of glanders, which is caused by a closely related organism. The disease, observed most often in adult males, may take an acute, subacute, or chronic form and may closely simulate other conditions. The acute form, in which vomiting, collapse, and purging may be followed by death within seventy-two hours, may be mistaken for cholera. The subacute and chronic types take the form of a more or less prolonged febrile illness associated with the formation of multiple abscesses which may be found in almost every organ except the brain, but particularly in the lungs, spleen, and liver. These forms may be mistaken for plague, malaria, enteric fever, pneumonia, amoebic abscess, bacterial endocarditis, or miliary tuberculosis. A diagnosis of smallpox has been made in cases showing cutaneous vesicles and pustules. Death is likely to ensue in a few weeks or months, but some recoveries are reported, usually in cases with solitary or accessible abscesses.

The essential lesion of melioidosis is a small area of focal necrosis which develops into an abscess, subsequently tending to coalesce with its neighbours to form a honeycombed lesion containing tenacious creamy or, in the liver, glairy greenish pus. Diagnosis is made bacteriologically, by culture of the causative organism from the blood in the early stages, from the pus of abscesses or pustules, from material obtained by splenic puncture, and occasionally from urine, sputum, or cerebrospinal fluid. *Pfeifferella whitmori*, a small Gram-negative bacillus with marked bipolar staining, grows readily on ordinary culture media in a characteristic mucoid or rugose form—so readily that it has probably sometimes been regarded as a contaminant. It produces a brownish honey-like growth on potato and ferments a number of carbohydrates with the formation of acid only. It differs from the glanders bacillus in being motile and in liquefying gelatin rapidly. Final identification may be made by inoculation of the organism into the guinea-pig which dies rapidly with abscesses in the spleen, liver, and lungs. Intraperitoneal inoculation in the male guinea-pig produces the Straus reaction—acute suppurative inflammation of the tunica vaginalis.

Although melioidosis is usually regarded as a rare disease, Stanton and Fletcher[3] estimated that it was responsible for at least 200 deaths annually in the Federated Malay States. It also appears in Burma, China, Indo-China, the Netherlands Indies, and Siam. Cases have been reported from Ceylon, Celebes, South Africa, and recently, by Mirick and his co-workers,[4] from Guam. Melioidosis occurs naturally in rats and more rarely in other animals, and, although Blanc and Baltazard[5-7] have suggested that the rat flea or the mosquito might transmit the disease, it seems likely that man acquires the infection by the ingestion of food contaminated by rats. *Pfeifferella whitmori* is not sensitive to penicillin *in vitro*, but Mirick and his colleagues found their strains susceptible to sulphadiazine and consider that this or some related sulphonamide is worthy of clinical trial.

1 *British Medical Journal*, 1912, **2**, 1306.
2 *Indian med. Gaz.*, 1912, **47**, 262.
3 *Studies Inst. med. Res.*, Federated Malay States, 1932, No. 21.
4 *J. Amer. med. Ass.*, 1946, **130**, 1063.
5 *Prev. Med.*, 1941, **48**, 1293.
6 Ibid., 1942, **50**, 33.
7 *C. r. Acad. Sci.*, Paris, 1941, **213**, 670.

NURSING CAMPAIGN

Although more nurses are being employed now than before the war, there is a shortage. The Gloucestershire scheme of part-time service planned by Mr. W. A. Shee, public assistance officer to the county council, has been successful in meeting this difficulty. Part-time schemes have been tried before without success, but there is evidence that the chief deterrent is not so much the work itself as the conditions under which it is performed, as Miss Amstrong suggests in an article on page 345 of this issue. The campaign for part-time nurses and midwives in Greater London launched in the Press and on the wireless by the Ministry of Health on Feb. 15 emphasizes the need for providing good welfare facilities, free meals on duty, and free facilities for laundering of uniform and, in certain circumstances, for travelling.

The Ministry has opened reception centres at the Paddington Hospital, St. Mary's (Islington) Hospital, Hackney Hospital, Dulwich Hospital, St. James's Hospital (Balham), and the L.C.C. Recruitment Centre (County Hall). In addition volunteers may apply to their nearest resettlement advice office. Voluntary hospitals are invited to participate. A clearing-house at the Nursing Appointments Office, 23, Portman Square, W.1 (Tel. : Welbeck 4486), co-ordinates with vacancies applicants who cannot immediately be placed.

Over 1,400 applicants in London have now volunteered to serve, and doubtless there would have been more if the severe weather had not restricted many people's activities to maintaining a coherent daily existence. If the response that has solved Gloucestershire's nursing problems can be induced in the rest of the country the closed wards and hospitals will be reopened and adequate nursing be provided at last for the chronic and aged sick. Further, the partially trained nurse, or the nurse who has completed her training but given up her career in favour of marriage, so far from being dismissed as "wastage," as at present, will be welcomed as a valuable ally.

THE PART-TIME NURSE

BY

KATHARINE F. ARMSTRONG, S.R.N., S.C.M. D.N.(Lond.)

Editor of the Nursing Times

The Gloucestershire scheme of part-time nurses, organized by Mr. W. A. Shee, public assistance officer to the county, has completely altered the position of the Gloucestershire public assistance institutions as regards nursing staff. Begun about a year ago, when the shortage of nurses to care for long-term patients was so acute that it seemed that wards and even whole institutions would have to close, the county now has 301 part-time "nurses" and a waiting list of those willing to help in this important work at some institutions. It has even been able to staff completely a similar infirmary for a neighbouring county at short notice. At a time when the whole system of caring for the aged and infirm seemed in danger of breaking down, these results deserve close study by all authorities faced with similar problems.

Actually the Gloucestershire "part-time nurses" are not all nurses in the present sense of the term, as defined by the Nurses Act, 1943. They are graded into State-registered nurses who serve as ward sisters or staff nurses, enrolled assistant nurses, nursing attendants, and nursing orderlies. All are engaged in nursing duties, the nursing orderlies being untrained women who are taught elementary nursing at the bedside and after at least six months' satisfactory work are promoted to the rank of nursing attendants. This training is of the type that many members of the nursing profession envisaged for the assistant nurse when the Nurses Act, 1943, was passed.

Success of Scheme

The most interesting point about the plan is that the matrons, although dubious at first of its success and fearful lest the part-time workers should fail to arrive, find that it has, in fact, brought a fine type of woman into their nursing service; it has provided a much better standard of nursing care than they could obtain by the employment of full-time nurses supplemented by temporary help from nursing co-operations, which was sometimes of a very inferior quality. The patients are happy and obviously well nursed. The scheme has produced one particularly interesting result. Out of the 301 "nurses" 72, or 24%, are State-registered nurses who have come forward to help in this emergency and are enjoying the opportunity of practising their art. What hospitals, acute or long-stay, can boast a 24% ratio of fully trained personnel in their nursing staff? Further, the nurses are happy looking after these long-term cases—many of them heavy cases and not a few incontinent. The authorities have always thrown the blame on trained nurses for their failure to help in this important branch of nursing work, which often requires all the ingenuity and skill of the qualified woman. Of course this experiment is young as yet, though it has successfully weathered a full year, so that the effect of novelty may be expected to have worn thin. Does it not, therefore, appear that the fault was rather in the conditions under which nurses were expected to carry out the work, and that perhaps the accommodation provided for them was the deterrent rather than the nature of the nursing work?

The answer may lie in the hours worked, as Dr. T. B. H. Haslett, consultant physician and pathologist to the Gloucestershire County Council, suggested at the conference held in Cheltenham in February to make the scheme more widely known. The part-time workers give what time they can spare, and many work only for a four-hour shift daily. The hours are 8 a.m. to 12 noon, 12 noon to 4 p.m., and 4 p.m. to 8 p.m. during the day, with a 12-hour night duty from 8 p.m. to 8 a.m. Dr. Haslett remarked that this meant that the individual part-time nurse probably had to change each incontinent patient once only a day, whereas the full-time staff would have had to do it several times, and this tended to be demoralizing. This ought not to be the case, for it is the patient's misfortune and not his fault, and, to the best nurses, sympathy for his plight and the need to help him to overcome his own distaste for life under these conditions completely oust all feeling of the disagreeable aspect of the work. It is queer how little the average doctor appears to understand this, though he must approach rectal and other less pleasant forms of disease in the same spirit if he is to be a first-class surgeon or physician.

Benefits of Rearrangement

The implementation of the scheme has meant a certain amount of reorganization, which also has its advantages. The greatest of these is that the patients are now not disturbed till 7 a.m.—a fact which they greatly appreciate. This is, presumably, the result of the fact that the part-time worker who has to travel to her work does not arrive until 8 a.m., and therefore the bulk of the morning routine ward work—washing, bed-making, and giving breakfasts—begins at a later hour. Every nurse realizes that her patients would appreciate being awakened less early. For those older patients, who may spend the rest of their lives in an infirmary ward, possibly a period of ten to twenty years, it is particularly beneficial. Dr. Haslett asserted that the rearrangement has not "interfered with the work of that non-celestial being" the doctor. This is interesting in view of the fact that a surgical ward for carcinomatous cases had been opened at the Cheltenham Infirmary to relieve the waiting list at the general hospital. The problem of waiting for the dust to settle after bed-making and sweeping before beginning purifications and dressings has been satisfactorily solved. If the general hospital of the future is to depend at all on part-time nursing this emphasizes the desirability of building new hospitals with a surgical dressing-room, into which beds and trolleys can be wheeled, as a part of every surgical ward unit. Certainly all patients would benefit from any scheme in which the ward day began at a later hour.

The scheme can succeed only if the part-time staff proves reliable. Very naturally matrons always fear this experiment, lest they be left without the essential staff to nurse the patients. There is greater risk of absenteeism, but the extent of it will be lessened if the part-time worker is made to feel that she is welcome, is an integral part of the staff, and has definite responsibilities. There are divided loyalties, of course; 86.5% of the Gloucestershire part-time nurses are married women with family responsibilities, or women living at home with family ties. If there is illness of children or husband the part-time nurse cannot carry out her obligations to the hospital, and a sufficient floating staff is essential to meet such occasions without disruption of the nursing service. Any hospital short of full-time nurses will still be better off with part-time assistance, and adequate relief arrangements, than it was before. In illness, too, it may well be longer before the part-time nurse can return to her work if it means a journey, perhaps in bad weather, in addition to the hours on duty. Suitable allowances must be made for these factors. In Gloucestershire the matrons have found the part-time staff reliable. They have not found that they expected the full-time workers to take all the less desirable periods of nursing service—at week-ends and holiday periods. In one infirmary, in fact, the part-time workers volunteered to come in on Boxing Day and relieve the full-time staff entirely, in spite of their outside ties.

Salary Scales

One difficulty with regard to the part-time scheme lies in the question of payment, and it must be squarely faced. The Gloucestershire scheme began before the Rushcliffe Committee considered the matter, and the scales offered were 2s. 6d. per hour for a State-registered nurse, 2s. per hour for an enrolled assistant nurse, 1s. 9d. per hour for a nursing attendant, and 1s. 6d. per hour for a nursing orderly, for those who worked for less than 24 hours per week; those working longer hours received a proportion of the Rushcliffe scales. The scale for the State-registered nurse is very low for a skilled woman with a three- or four-year training behind her. It is, however, definitely higher proportionately than the salaries of the full-time worker in the case of the staff nurse, though lower in the case of the ward sister. Nevertheless it has elicited a satisfactory response, and neither the full-time nor the part-time workers appear discontented. The Rushcliffe Committee has, however, now issued

a salary scale for the nursing ranks, and it is as follows : 2s. 10d. per hour for the ward sister, 2s. 1d. for the State-registered nurse, and 2s. for the enrolled assistant nurse. These figures the committee reached by taking the average salary for the rank—i.e., the salary after five years' service—and allowing an additional 12½% loading because the part-time worker had no pension rights and no security of tenure. The figures serve to reveal how low the basic salary scales still are, though they show nursing salaries in an unfortunate light to the layman because of the under-valuation of the nurses' emoluments. For these calculations the nurses' board, lodging, laundry, service, and medical care are valued at £100 per year for the staff nurse and £120 a year for a ward sister. Most part-time nurses will probably be in the staff nurse category. It is quite impossible, certainly in London, to obtain bed and breakfast for less than £2 per week, excluding other meals, personal laundry, and service. The part-time worker lives out in a world where prices are greatly increased. She may have to obtain reliable domestic help to enable her to leave home at all ; it will probably cost her at least 2s. per hour and be difficult to find.

The full-time worker should not therefore grudge the part-time worker a higher salary scale than that which the Rushcliffe Committee suggests. She has the benefit of her pension rights, her security of employment, her holidays with pay, and opportunities for promotion. She may not appreciate these advantages fully to-day, but she will later. She should do all in her power to attract the part-time nurse and work for improvement in her salary scale as well as in the scale for the full-time workers in the nursing services. Part-time nurses have already volunteered to help in London, and in other counties where similar appeals are being made, in quite good numbers. So long as there is a shortage of full-time workers—and this may well be permanent—they will be needed, unless beds are to be limited. In London the total is about 1,000 helpers within three weeks, and 173 of them are State-registered nurses. In Gloucester the part-time nurses have themselves proved the best advertisement for the scheme and brought in many others. There is no reason why this should not be so elsewhere and prove a permanent factor in meeting the nursing shortage.

WELFARE OF DISABLED IN SCOTLAND

In November, 1946, the number on the Disabled Persons Register in Scotland was 61,840, said Sir Andrew Davidson, speaking at the Council of Social Service Conference at Perth on Feb. 14. Of these the surgical group (amputations, injuries, and diseases affecting the bones and joints) accounted for nearly 29,000 ; the medical group (rheumatic conditions, diseases of the heart, lungs, nervous and digestive systems, and the skin) nearly 19,000 ; the psychiatric group nearly 3,000 ; and the remainder (congenital malformations, deafness and other ear troubles, blindness and other eye diseases) over 11,000.

The preventive aspect was being tackled from social, nutritional, and industrial health angles. A striking example was the improving figures for pulmonary tuberculosis, largely attributable to the higher standard of milk production. In 1937 there were 769 herds producing certified and tuberculin-tested milk ; now there were no fewer than 3,729. Blind persons in Scotland numbered roughly 9,000. Blindness in the young was decreasing, mainly due to the advent of new drugs and to better maternal and infant welfare. Schools for the deaf provided for 661 children, but the waiting list numbered 122 and included children over 9 years of age who had never been to school. Inadequate school accommodation and the lack of trained teachers were the main factors against progress.

Since the war a good start had been made in Scotland towards a scheme for the treatment of orthopaedic cases. Orthopaedic centres had been developed at seven hospitals in the E.H.S. of the Department of Health, where over 2,000 beds had been provided. That number was now less, owing to diminished requirements and the shortage of nursing staff. Each hospital had a specialist staff ; each unit had been supplied with the necessary equipment for physiotherapy ; and handicraft workshops for occupational therapy had been provided. After-care clinics were being set up in connexion with the main centres and in collaboration with voluntary organizations and local authorities. A further welcome development had been the association of the universities and medical teaching schools with regional orthopaedic schemes. Lectureships had been created in Glasgow and Dundee, and similar appointments were being made in Edinburgh and Aberdeen. Of educable mental defectives Sir Andrew said all larger authorities and some smaller ones had provided special schools or classes, but there were still many areas, particularly rural, where facilities were few and no institutional provision had been made. Some such areas had contracts with existing certified institutions, but at present these were often not available on account of lack of accommodation, and children had to remain at home and in some cases attend the local school. Many who were interested in these matters considered that more adequate ascertainment was needed by specially qualified medical officers.

Defects of temperament and behaviour had only comparatively recently been recognized as worthy of special study and treatment. "Now that we know," he said, "to what extent the temperament of a child and the trend of character development are determined in the first five years of life, it is easy to see how important it is for maladjustment in young children to be detected and given skilled treatment at as early a stage as possible to prevent juvenile delinquency and neurosis developing at a later date."

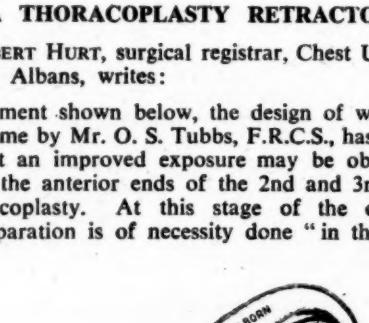
Sir Andrew concluded by saying that the Department of Health was making a survey of existing rehabilitation facilities to determine at which hospitals they might best be developed in the future. The Disabled Persons (Employment) Act, 1944, constituted the most comprehensive piece of legislation in the history of the welfare of the disabled. Success in resettlement depended largely on the attitude of employers, especially foremen, and on the person's own determination and keenness to succeed.

Preparations and Appliances

A THORACOPLASTY RETRACTOR

Dr. R. LAMBERT HURT, surgical registrar, Chest Unit, Hill End Hospital, St. Albans, writes:

The instrument shown below, the design of which was first suggested to me by Mr. O. S. Tubbs, F.R.C.S., has been devised in order that an improved exposure may be obtained during resection of the anterior ends of the 2nd and 3rd ribs during upper thoracoplasty. At this stage of the operation the periosteal separation is of necessity done "in the dark," with the consequent risk of damage to the pleura or internal mammary vessels. By the use of this retractor the pectoral muscles are readily held away from the ribs, allowing all the periosteal separation to be done under direct vision.



Although originally designed for use during a thoracoplasty, the instrument is of use during abdominal operations—its long blade allows of deep retraction, the handle being well away from the operation field.

The instrument, in stainless steel, may be obtained from the Holborn Surgical Instrument Co., Ltd., London, E.C.1.

Reports of Societies

AETIOLOGY OF CHRONIC RHEUMATISM

A discussion on the aetiology of chronic rheumatism took place at a combined meeting of the Medicine and Physical Medicine Sections of the Royal Society of Medicine on Jan. 28. Dr. MAURICE DAVIDSON presided.

Historical Introduction

Dr. W. S. C. COPEMAN said that the word "arthritis" was of great antiquity; it was used by Galen and his successors for infections of the joints of the body. As a generic term it included gout. Rheumatism and arthritis were explained in terms of the humoral theory until well on in the eighteenth century. Rheumatism was considered as the discharge of a catarrhal humour into the blood. Osteoarthritis was first described as a disease distinct from gout by William Heberden in his *Commentaries on Disease*, published in 1802, the year after his death. The chemical view of rheumatism started about the middle of the nineteenth century and enjoyed a brief popularity. The name "rheumatoid arthritis" was coined by Sir Archibald Garrod. The term "rheumatic gout" was given to a disease in no way related to gout and not necessarily to rheumatism, and sometimes called "rheumatic arthritis." Charcot put forward his views in 1868, and the neurotrophic hypothesis associated with the name of Weir Mitchell lingered on until the end of the last century. Later came the view that rheumatoid arthritis might be primary or secondary. In 1909 A. E. Garrod suggested a metabolic factor, and this theory was taken further a few years later. The hypothesis of infection apparently first came into history in 1803, when an American physician, Benjamin Rush, cured a case of what appeared to be rheumatoid arthritis of the hip by the removal of an aching tooth. In modern times the theory of focal sepsis had been popularized by the late Sir William Willcox and others and had perhaps been too much exploited. Although osteoarthritis was a very ancient disease, it was not clinically differentiated from other forms of arthritis until 1829.

The Concern of the General Physician

Dr. PHILIP ELLMAN, in a lengthy and comprehensive paper, declared the term "chronic rheumatism" to be ambiguous and unscientific. Before discussing the aetiology an attempt should be made, he said, to define and classify the conditions which were described as "chronic rheumatism." This description covered a group of diseases of the locomotor system, and constitutional disturbance might or might not be present. His own preference was for a return, with slight modifications, to the classification originally propounded by Sir Archibald Garrod in 1890. The classification suggested by a committee of the Royal College of Physicians in 1934, however, was probably the most comprehensive and scientific to date.

Chronic rheumatism was a disease of unknown aetiology, associated with morbidity rather than mortality, and treated in the main almost with indifference by the profession. The prevailing general attitude of defeatism in relation to rheumatic diseases as a whole and to chronic arthritis in particular was not justified. It was his firm conviction that rheumatic diseases were primarily the concern of the general physician working closely with the general practitioner rather than of the ultra-specialist. He had no wish to disparage the contribution which specialization had made and could make to this subject. Co-ordinated teamwork by the physician, the specialist in physical medicine, the orthopaedic surgeon, the physiotherapist, and others was essential, but the final assessment of the patient as a whole rested with the general physician, who must interpret the local manifestations in relation to the general background.

Dr. Ellman mentioned the effect of pregnancy. He had no record of arthritis developing during pregnancy, and cases had been described in which pregnancy had been a therapeutic measure. The potential significance of the pituitary in relation to chronic rheumatism had received considerable attention, and hopes had been raised with regard to irradiation of the pituitary. Among other aetiological aspects he touched upon the geographical distribution of rheumatism, a disease of temperate climates, but he felt that faulty domestic heating and ventilation was more potent than climate as a causative condition. He emphasized the need for taking a complete history of the patient. In how many cases was any real investigation made of habits and environment? He gave particulars of a survey of 100 cases of the rheumatoid type of arthritis, and mentioned, incidentally, the large preponderance of women over men (in this survey 3 : 1), the age incidence (nearer 40 than 20), and other factors. He described some biographical studies which he and his colleagues had made on cases of fibrositis in civilian and Service patients during the war.

A Sensitization Factor

Dr. G. D. KERSLEY discussed the phenomena of sensitization in relation to this problem. He first separated off cases of the osteoarthritic type. Generally speaking, these were characteristic in that they were joint affections only, and their aetiology was referable to two things—a predisposition in the joints, which were generally of a poor type, and trauma, most frequently repeated small strains, possibly arising from bad posture. With regard to the rest of the rheumatic group the more cases one saw the less sure one became. Each syndrome was completely clear in itself so far as the more typical cases were concerned, but there were many intermediate cases and many common factors. Attacks might be started by a number of aetiological factors common to all the groups. In none of these syndromes had any specific infection been proved, yet in all of them it was not uncommon for any infection to bring on the condition or exacerbate it.

Was there any theory which could connect all these various factors? The only one he could suggest was an altered reaction to a foreign protein. Experimentally it had been shown that the local tissue reaction in sensitized animals was mesodermal only, and it did resemble in many ways the granulomata found in rheumatic fever and rheumatoid arthritis. It could be shown experimentally that that particular reaction might be confined to one area by producing a localized hyperaemia or by trauma or fatigue, and these were exactly the factors which localized the phenomena in rheumatic conditions, particularly in gout and in fibrositis. Another point in favour of the theory was the rheumatic pains, and often the swelling of the joints, which were not uncommonly found in the course of immunization, for example, against scarlet fever. Again, when rheumatism in any form arose as a result of infection there was almost invariably a lag between the infection and the onset of the rheumatic stage, and the commonest time-lag was ten or fourteen days, which was also the common period for sensitization. Another argument for the theory of sensitization allergy was the reaction of many rheumatic conditions to salicylates and the complete absence of reaction of all rheumatic conditions to penicillin or the sulphonamides.

Accepting the possibility of sensitization as underlying the rheumatic state, the factors which might contribute to produce susceptibility to sensitization included hereditary predisposition, depression of antibody in the blood stream by reason of chronic infection, fatigue, exposure to climatic conditions, and upsets of the autonomic nervous system occasioned by worry or shock; all these were common factors in the various rheumatic syndromes. He suggested as a possibility that an endogenous type of allergen was formed in certain cases in addition to the various exogenous allergens, and he thought that this opened up a certain field for research.

Perhaps because the openers had covered the subject so completely, there was almost no general discussion, and the openers had nothing to which to reply.

VIRUS AND LABORATORY

Delivering the Chadwick Lecture, "Laboratory Investigations in the Diagnosis of Virus Infections of Man," on Feb. 18 at the Royal Society of Tropical Medicine and Hygiene, Prof. S. P. BEDSON said that although it was understandable that there should be some delay in the findings of research passing into everyday knowledge, in the case of virus work this delay was unduly long. Much of the work of the past fifteen years had gone unnoticed and insufficient use was made of the diagnostic procedures which virus research had made available. It was still widely believed that all viruses were too small to be seen with the microscope, yet in quite a number of virus diseases

microscopic demonstration of the causal agent was of diagnostic value. This was true of trachoma and of those conditions caused by the nearly related virus of inclusion conjunctivitis. The virus of lymphogranuloma venereum could at times be demonstrated in smears made from the inguinal buboes which occurred in many cases of infection with this virus, and recent work had demonstrated the diagnostic value of the microscopic examination of smears made from the skin lesions of smallpox. Even where demonstration of the virus by the microscope could not be achieved, histological changes, such as inclusion bodies, could be looked for; their occurrence was always suggestive of a virus infection, and in certain instances, such as the Negri body in rabies, it was diagnostic.

Valuable though microscopy might be in the laboratory investigation of virus disease, as in any infection, the aim of the laboratory should be the isolation and identification of the causal agent. In the case of viruses this entailed the injection of experimental animals or eggs and establishing the viruses preparatory to their study. Unfortunately quite a number of viruses affecting man were so specifically adapted to man as to make it impossible to grow them apart from human tissues, and even where animals or the egg were suitable the time consumed in identifying the virus made the procedure of little or no use for immediate diagnosis. None the less, whenever the diagnosis was in doubt attempts to isolate and identify the causal virus should be made. It was still far from being generally appreciated that the serological reactions employed in bacteriology were equally applicable to the identification of viruses or the diagnosis of virus disease. Of these reactions the complement fixation test was probably the most valuable for virus work. It could be used either for the demonstration of the presence of the causal virus, as was the case when it was applied to the diagnosis of smallpox, or it might be employed for the detection of antibody produced in response to infection, as in influenza, psittacosis, lymphocytic choriomeningitis, lymphogranuloma venereum, or mumps.

A REGIONAL MIDWIFERY SERVICE

At a meeting of the Manchester Medical Society on Feb. 5 Prof. DUGALD BAIRD said that the focal point of a regional maternity scheme should, if possible, be a university teaching hospital alongside the general hospital, the children's hospital, and the medical school. Placed conveniently in the district round the hospital there should be health centres which would be the headquarters of the family doctors and midwives engaged in domiciliary midwifery. An obstetrician on the staff of the maternity hospital should visit each centre each week to see women booked to come into hospital for confinement, and to see in consultation with the family doctor any case about which he wanted an opinion. In the same way a member of the staff of the children's hospital would supervise and direct the child welfare work in conjunction with the family doctor. This would leave the out-patient department at the hospital free for the investigation of special cases.

The family doctors, midwives, and health visitors based on the health centre would take part in the teaching of medical students and nurses. Such a scheme was well under way in Aberdeen except for the fact that the family practitioners worked from their own homes and not from health centres, and played less part in the scheme than they would if they were working from a well-equipped centre. Each doctor must be made to feel that he or she was an essential member of the team supplying a first-class service for the area. To promote this, frequent clinical meetings should be held at the hospital, when problems of organization, results of treatment, and recent advances in the subject could be discussed. There should be a good records department where the details of every confinement, not only in hospital but in the whole area, could be analysed. In this way problems could be investigated on a much wider basis and attacked from the laboratory, statistical, and social aspects. Very many problems in medicine as well as in midwifery were urgently in need of study by some such organization. In this way, too, the efficiency of the service in one area could be compared with that of another.

During the last ten years in Aberdeen maternal deaths, stillbirths, and neonatal deaths had been analysed for the whole area by the obstetrical staff of the hospital in conjunction with the medical officer of health. Analysis of the figures had led to clear conclusions being reached as to the deficiencies in the present service. It had shown that the use of sulphonamides and penicillin had practically wiped out deaths from puerperal sepsis. The death rate from eclampsia had been halved in the last ten years. Under the Maternity Services (Scotland) Act it was calculated for the purpose of assessing fees that the doctor would make three antenatal visits. This was quite inadequate. The death rate from shock and haemorrhage had diminished least, so that there was still room for improvement in the management of abnormal labour.

War experience had shown conclusively that in the prevention of deaths of mothers and infants much attention had to be given to the health and diet of the mother. The problem of a good obstetric service was a very much wider one than that of keeping up the standard of medical and nursing skill. The measures taken to lower mortality would also help to lower morbidity. There was still a lot to be done to make a first-class service available to every mother at a reasonable cost.

CATERING FOR THE AGED AND INFIRM

A conference on "Special Forms of Catering for the Aged, Invalid, and Infirm" was held by the London Council of Social Service on Jan. 18 under the chairmanship of LORD AMULREE. Representatives of many statutory and voluntary bodies attended.

Dr. F. AVERY JONES pointed out that with the limited supply of home helps and domestic servants many people were unable to get proper meals while they were ill, so that recovery was retarded. Old people and convalescents, unable to cope with shopping and cooking, were similarly affected. At least 10% of the admissions to hospitals were not for specific treatment but for rest, food, and medical supervision which, given proper facilities, could be provided at home. A food delivery service providing cooked meals for such people should be established in every borough, and feeding centres for those in need of special diets (a preliminary survey in London factories showed that over 5% of the men had, or had had, a gastric or duodenal ulcer); he referred to the advisory service provided by the Invalid Kitchens of London to assist works canteens in catering for employees with special medical needs. Such facilities as these, and a campaign against obesity—an extra stone (6.3 kg.) in weight at middle age lessened a man's expectation of life by 10%—could also do much to keep people out of hospitals.

Dr. MAGNUS PYKE showed that, while the calorific needs of the aged were rather less than for younger people, their nutritive needs were as great. Research recently carried out in Vienna—where there had been severe food shortages—showed that loss of weight through malnutrition occurred more severely among old people. Surveys must be carried out to discover what kind of a diet old people were eating.

Mr. FRED MESSER, M.P., advocated the provision of more "home helps" to assist old people in preparing the right kind of meals and to help keep them out of institutions. A common dining-room would help old people living in specially built groups of houses or flats. In other cases mobile services should take the meals in containers. In the past such services had been left to voluntary agencies, and he did not want to dispense with the valuable personal service which they rendered; but while they should retain their function, the expense should be borne by the community, and the responsibility for this and other aspects of old people's work should be assumed by the local authority. Good food and good cooking in hospitals were often spoilt between kitchen and patient, and each hospital should be provided with a catering manager to see that the right kind of food was provided in a palatable condition.

For the last session Miss ROSE SIMMONDS and Miss KATHLEEN PROUD opened a discussion on luncheon clubs and mobile meals services. It was not generally realized by catering officers in factories, convalescent homes, and restaurants that special diets could often be prepared from the same food as that served to ordinary customers—the meat fleeded to be minced, the vegetables sieved, and the steamed pudding served without fruit but with a sauce. Simple adjustments could also serve the obese, diabetics, and old

people. Mobile meals services should serve maternity cases, convalescents, and the chronic sick, especially the aged. Vans equipped with thermostatic containers should operate from communal meals centres, leaving the meals at people's homes and collecting the containers left on the previous day. The Invalid Kitchens of London was a voluntary organization serving mobile meals in six London boroughs, in only one receiving assistance from the local authority. In eight other boroughs mobile services were provided by the local Council of Social Service, Old People's Welfare Committee, Red Cross, or Women's Voluntary Services.

In summing up LORD AMULREE emphasized that there was a great shortage of hospital beds and any special feeding arrangements that would help to keep people out of the hospitals would be a valuable service to the community. He advocated the appointment of meals supervisors in hospitals and institutions. The present arrangements for the care of old people were inadequate and local authorities must take their part in this work. Old people should be allowed to take their own furniture when they went to a special home or institution.

Mr. GEORGE MITCHELL, Chairman of the London Council of Social Service, in thanking Lord Amulree and the speakers said that his Council had been responsible for a good deal of pioneering and research in connexion with communal feeding.

"THE SHORT ANAESTHETIC"

At a meeting of the Devon and Exeter Medico-Chirurgical Society on Feb. 20, Dr. W. A. WALTER discussed those anaesthetics commonly used in general practice.

It should be borne in mind, said Dr. Walter, that gas anaesthesia was achieved solely by producing a state of partial asphyxia. For dental extractions it was intended to be short but occasionally became a protracted affair. After such an experience the patient might be none the worse, but in one long series reported in the United States there had been eleven cases of sudden death, one case of prolonged decerebrate rigidity ending fatally, and a case of marked and apparently permanent mental deterioration in an unusually intelligent child. The anaesthetist had to decide whether to call a halt or to risk damage to the patient's cortical cells.

Domiciliary anaesthetics were required for minor operations, but there was no such thing as a minor anaesthetic. Intravenous thiopentone ("pentothal") had much to commend it provided that certain precautions were observed. There should be no premedication, there must be an unobstructed airway, and the patient should not have taken food for three to four hours beforehand. There was danger of asphyxia in the recovery stage, especially after premedication or after a large dose of thiopentone. There was also a risk of laryngeal spasm with this drug. When administering thiopentone in a patient's home, the anaesthetist should have with him at least twice the amount that he expected to use, tongue forceps, nikethamide, and if possible a cylinder of oxygen. He should not leave the house until the patient was able sleepily but sensibly to answer questions, and he must instruct some relative or the nurse not to leave the patient unattended until he was fully "round" and talking rationally.

For the senile, the anaemic, and the septicaemic thiopentone was undoubtedly preferable to gas. Senile patients required far less than younger subjects. The dose given should be the smallest required to produce the desired effect and the rate of administration could be controlled conveniently by using a fine needle, say a No. 17. The patient usually became unconscious with a contented sigh. This degree of anaesthesia should give two or three minutes of relaxation. If a longer period was needed as much again of the drug should be given slowly, keeping careful watch of abdominal respiration. If the breathing stopped the administration should be stopped at once until breathing started again. If it did not start again soon artificial respiration should be begun before the patient lost his pink colour. Oxygen was better than fresh air, but the latter was to be preferred if there was any delay with the oxygen. To produce local ring analgesia for a whitlow by repeated injections was a painful process. While it was being done the patient should be given gas and air, by a self-administering machine, or trilene, through an inhaler.

Correspondence

The Pemmican B.M.J.

SIR,—May I congratulate the *B.M.J.* on having, almost alone among periodicals (suspended by an illegal ukase), defied successfully the latest effort to establish totalitarian methods by our egregious Minister of Fuel. These two pemmican substitutes should find an honoured place in the archives of the B.M.A.

The position was clarified by two debates in Parliament—in the Commons on Feb. 25 and 26, and the Lords on Feb. 27. Two explanations of the suspension were presented, conflicting with one another and with the facts. In both Houses the pretence of any statutory sanction was immediately abandoned. On Feb. 25 in the Commons the Prime Minister, challenged at question time for the statutory authority upon which suspension had been made, declared twice over that it was "done by agreement" between the Periodical Proprietors' Association (P.P.A.) and the Government. Lord Chorley, replying for the Government in the Lords (Feb. 27), repudiated the "agreement" argument. "Suspension of publication was secured," he said, "by an instruction issued after consultation with bodies representing major interests in the newspaper and periodical Press." Speaking with all the authority of a Professor of Law in the University of London, he declared categorically that "instruction is the word which I think most accurately describes" the procedure adopted.

The ascertained facts are that Mr. Shinwell had issued the "instruction" *three days before any consultation with the P.P.A. was attempted.* The "instruction" had, and was intended to have, all the appearance of an imperial rescript. The P.P.A., taking that view of it, and confronted with an accomplished fact, had no alternative but to "agree." Your information conveyed in the pemmican issue and in the current *Journal* that you were officially scolded, not for using electricity, which you had not done, but for coming out at all, is another illustration of effrontery in high quarters.

But there is yet a further consideration of major importance. It was well known that during this momentous fortnight the Minister of Health was to be engaged in critical negotiations with the medical profession, upon which he had very reluctantly embarked and only when faced with the wholesale revolt by the profession against his Act. It is obvious that it might have been extremely convenient for the Minister to prevent during these negotiations publication of the medical journals whose duty and whose function it is to keep the profession fully informed on matters of such vital importance to it. The possibility of such back-stage ministerial intrigues lends a sinister significance to this new encroachment on our liberties.—I am, etc.,

House of Commons. E. GRAHAM-LITTLE.

SIR,—Reading the *B.M.J.* No. 4494 prompts me to send congratulations to you and your staff on account of the way in which you manage to carry on in the teeth of appalling conditions! The spirit behind that copy certainly deserves our admiration. Just at present we too, in Denmark, are shivering and talking about fuel, but spring cannot be far behind.—I am, etc.,

Randers, Denmark. OLE BANG.

SIR,—Congratulations to yourselves and your "printer" on this week's *Journal*. It raises our confidence in the Association's perseverance in other spheres.—I am, etc.,

Ross, Herefordshire. G. M. LLOYD.

SIR,—I write to express my appreciation and admiration for the last two issues of the *Journal*. It is gratifying that even in these sad times there are still people who show initiative.—I am, etc.,

Liverpool. ISABELLA FORSHALL.

SIR,—Enormous congratulations on maintaining the freedom to print. *Prosit omen! Floreat libertas!*—I am, etc.,

London, N.W.3. L. W. BATTEN.

SIR,—"Peace hath her victories no less renowned than war" could hardly be better illustrated than by the abbreviated *Journal* of the last fortnight, upon which, Sir, the profession must most warmly congratulate you.

May I plead that some of this excellent editorial précis writing is continued? Without it how many of us would have learnt that "outfitters won't give long trousers to son aged 7 without doctor's certificate"; "certificates must be renewed that leg still off each time applying for extra soap allowed"; or the story of the night porters and the hansom cabs. *Floreat brevior B.M.J.!*—I am, etc.,

London, W.1. HENRY WILSON.

SIR,—I feel I must write and congratulate you on your two fine efforts. You and your staff deserve the highest praise for a grand show. If our rulers had half the guts you people have our country would not be in its present condition.—I am, etc.,

Hemel Hempstead. E. S. PHILLIPS.

SIR,—While not particularly anxious to dim the glow of complacency which, I presume, appears on the faces of all at B.M.A. House, I must protest against your efforts in producing the *B.M.J.* during the fuel crisis.

In my opinion only two courses were open to you: either (a) fall in line with good grace like the other periodicals, or (b) defy the "ban" and produce the *Journal* as usual, since no legal proceedings could have been taken against you. Sixty-two thousand sheets of paper and sixty-two thousand envelopes—what a waste of paper and effort!

The first issue I scanned with startled amazement; the second I put at the back of the fire unread. Am I alone in my feelings in this matter?—I am, etc.,

Nelson, Lancs. A. J. P. DALY.

Statistics: Retrodisplacement and Fertility

SIR,—The burdens of the research worker in medicine have been added to in recent years by the vociferous advent of criticism from the statisticians. Conscious of the immense amount of labour that has gone into the preparation of even a short paper he is apt to resent what he considers are the facile criticisms of the man who wields a slide-rule in an arm-chair. It is indeed much to be regretted that so often the statistician's summing-up ends in the words: "Your data are insufficient on which to base any conclusion." Of course such a picture of the statistician as a sort of kill-joy is extremely one-sided. On the contrary, statisticians have repeatedly pointed out that ignorance of statistical method may lead to a conclusion *not* being drawn, that significant answers to questions may be missed.

In the hope that this preliminary apology will avert wrath, I would like to discuss the article by Mr. H. H. Fouracre Barns, "Retrodisplaced Gravid Uterus" (Feb. 1, p. 169). It is not my intention to deal with the logical errors in his conclusions, for they do not make much difference in the end, and in any case they are no worse than is to be found in many other articles. His general conclusion, that his figures do not disprove the hypothesis that retrodisplacement (without incarceration) does not significantly predispose towards abortion (I hope he will accept my re-wording), is quite correct. It would have been easier for his readers to see if he had arranged his figures (p. 170, col. 1) in a table:

TABLE I.—*Incidence of Abortion up to Twelfth Week of Pregnancy*

	Aborted	Not Aborted	Total
Retrodisplaced uterus ..	2	25	27
Not displaced	54	393	447
Total	56	418	474

It is scarcely necessary to do a χ^2 test to demonstrate that there is no significant difference in the number of abortions in the two types of uterine position.

Hidden in the mass of figures in his article are some which are of profound significance. Mr. Barns quotes the figures of Polak, 1926, who found "18% of congenital retroversions in nulliparous women and 35% in post-partum women." Mr. Barns found, at University College Hospital, the following figures: 381 primigravidae, of whom 21 had a retrodisplaced uterus, and 93 multiparae, of whom 6 had malposition. If we take a comparable number from Polak's figures (the conclusion is even stronger if we take his total number) we can arrange them as follows:

TABLE II.—*Incidence of Retrodisplacement of the Uterus in Nulliparous Women*

	Displaced	Not Displaced	Total
U.C.H.: pregnant	21	360	381
Polak: not pregnant	69	312	381
Total	90	672	762

$$\chi^2 = \frac{(69 \times 360 - 21 \times 312)^2 \times 762}{90 \times 672 \times 381 \times 381} = 29{\cdot}1. \qquad P = \text{less than } 0{\cdot}001$$

The test means that if there were no difference in the incidence of pregnancy between the women with displaced uterus and with normal uterus, the chances of getting such figures are less than one in a thousand. The discrepancy is due to the small number of pregnant women with displaced uterus. The figures clearly disprove the hypothesis that displacement has no deleterious effect on the incidence of pregnancy, and they disprove it as conclusively as could be desired. I would hasten to add that this does not invalidate Mr. Barns's statement: "that any woman complaining of sterility in whom the only abnormality to be found is a retrodisplaced uterus should be investigated and treated along the same lines as would be a woman with an anteverted uterus." Retrodisplacement is only one factor in the causation of infertility, and careful investigation is the common-sense procedure of the careful surgeon who does not rush to operate without sufficient reason.

A measure of the association between retrodisplacement and infertility may be obtained from the above figures. Since the variables fall each into two definite categories, the best coefficient would be the φ coefficient, which is the correlation for point distributions. This comes to just below 0.2, which explains why, although the association has been observed, there has been much uncertainty over it.

A similar table could be constructed comparing the U.C.H. multiparae with Polak's post-partum women, but on turning to the original statement of Polak I find that he declares that post-partum retroversion is not a fixed condition but may return to normal in the course of several months. The two sets of figures (U.C.H. and Polak) are therefore not comparable, and conclusions drawn from them may be fallacious. This point reinforces the oft-repeated statements of my teachers: statistical techniques are only the numerical form of the logic of scientific method; the right time to consider statistics is before an investigation is begun, not when it is over.—I am, etc.,

London, W.C.1. M. HAMILTON.

Intestinal Myiasis

SIR,—Dr. Alan M. Easton has been kind enough to send me an article with the above headline published in this *Journal* by Dr. D. S. Sharpe on Jan. 11 (p. 54). As my name is mentioned in that report it may easily be inferred that I concur with the views expressed in it. I am therefore compelled shortly to discuss the matter in this *Journal*. When returning the larvae and stating their scientific name as *Ptinus tectus*, Boield., I added: "It is hardly possible that the specimens should have passed the stomach of the patient, and I suggest that they have got into a vessel used for receiving or transmitting the excrements." Unfortunately the author did not mention this warning in his report, and it appears therefore desirable to elaborate my statement in the following lines.

The evidence for an actual passing of the larvae in the stool of the patient does not hold good to scientific scrutiny. The account does not mention in what type of vessel the stool was examined by the patient nor where this vessel was kept before use. It has obviously not been a water-filled lavatory basin, and there is a great possibility of the larvae having fallen into the vessel from some infested material, such as a mattress, cushion, blanket, or the like. As the larvae are of a more or less creamy colour they would to all intents and purposes be invisible to a layman if lying in the usual type of vessel.

On the other hand there are very serious reasons for disbelieving any possibility of these creatures having passed the intestine. The chemical objections have to some extent been considered by Dr. Sharpe, and he himself discounts the possibility of the soft-skinned larva resisting the protein-digesting secretions of the stomach. He therefore assumes that the eggs with their "resistant chitinous coating" can pass the stomach unharmed and that the larva can hatch from the egg in the more alkaline portion of the bowel. In actual fact the egg membrane of the ptinids is very fine and thin, and in the absence of experiments does not justify the assumption of its being much more impervious to pepsin and hydrochloric acid than the chitinous integument of the larva. In order to obtain conclusive evidence on this subject I have treated eggs, newly hatched larvae, and almost full-grown larvae of *Ptinus tectus*, which were kindly placed at my disposal by the Director and Mr. R. Howe of the Pest Infestation Laboratory, Department of Scientific and Industrial Research, with artificial gastric juice. The specimens were first admixed to chewed bread, and the experiment was kept at 36–38° C. for three hours. The material was then washed in distilled water and scrutinized under a dissecting microscope. Full-grown and newly hatched larvae were dead but not disintegrated, and larvae more or less ready for hatching had been killed inside the eggs. There is no evidence so far (after ten days) that any of the less developed eggs have hatched. The fact that young larvae have definitely been killed inside the intact egg-shell seems to prove at any rate that the egg-shell does not afford a considerable protection against the influences prevailing in the human intestine.

Dr. Sharpe has also stressed the mechanical difficulties for the larvae of remaining in the intestine for a period of a week or more in view of the action of the peristalsis. According to him the larva holds itself in position by its claws and jaws. In actual fact the rather thin claws would probably be of little avail, while the jaws would be wanted for the ingestion of the food, so that they could not possibly keep their grip. On the other hand this point is of minor consequence, as an insect larva of this type developing in the intestine would find a nook at the base of the villi or somewhere else where it would be relatively safe, and it would soon create a small excavation round its body in which it could rest securely.

Ptinus tectus lives in dried animal or vegetable matter, such as dried crayfish (e.g., of collections or of food for aquarium fish) and casein (in which latter it is a regular pest) on the one hand, and in rye, maize, cayenne pepper, cocoa, ship's biscuit on the other hand. It is therefore very well adapted to a life in a medium containing between 5 and 15% humidity. The larvae would, however, be quite unsuited to a habitat in a stiff semi-liquid material with a moisture content of more than 90%, as is found in the human intestine, and they would very quickly be clogged up and asphyxiated. While experimenting with artificial gastric juice I kept another batch of eggs and newly hatched and almost full-grown larvae in chewed bread in a moderate quantity of saliva without gastric juice for 31 hours at about 20° C. This treatment, too, killed the larvae, but it is too early yet to decide whether all the eggs have been killed in this experiment. Mr. Howe has informed me of some tests with much lower degrees of humidity in hygroscopic foods with an estimated water content of up to 40%. As only a small percentage survived in these materials it is obvious that a further increase of the water-content would soon prove lethal, as shown in my own experiment.

The gravest reason, however, for scepticism is afforded by the question of temperature. It is known from experiments with eggs of the flour-moth (*Ephestia kühniella*, Zell.), an insect which lives under very similar ecological conditions, that they cannot hatch but will perish at a prolonged exposure to a temperature of 34.4° C. or more. Even in a moist cell it has not been possible to raise this temperature (Hase, A., 1927, *Arb. biol. Reichsanst. Land u. Forstwirtsch.*, 15, 116). As to *Ptinus tectus* itself Mr. R. Howe informs me from his experience, gained at the Pest Infestation Laboratory, that only large larvae survive for long at 28° C. or above, and that only few first-stage larvae reach the second stage at all at as moderate a temperature as 29° C. The most conclusive point against Dr. Sharpe's view, however, is the fact that, according to Mr. Howe's experiments, *eggs do not hatch above* 28° *C.*, so they would hardly remain alive for a day and certainly never hatch at the temperatures prevailing in the human intestine.

Lastly a point of terminology should not pass without comment. The term myiasis, derived from μυῖα, a fly, designates the "infestation of any part of the body of living animals by the larvae of diptera," or two-winged flies (Smart, J., 1943, *A Handbook for the Identification of Insects of Medical Importance*, p. 810, London: British Museum). A similar infestation by beetles or their larvae is called cantheriasis. Entomologists have for some time been aware of the fact that many reports of myiasis and similar ailments collapse on closer examination, and modern textbooks like that of Smart duly stress the necessity for a thoroughly critical examination of each reported case. My personal impression is that in temperate European countries the larva of the lesser house-fly is most likely to produce genuine cases of myiasis, and that certain tyroglyphid mites can probably produce similar and sometimes rather serious symptoms.

I would like to express my thanks to the Director and Mr. R. Howe, Pest Infestation Laboratory, Department of Scientific and Industrial Research, Slough, Bucks., for breeding material of *Ptinus tectus* and for the information cited above; to Mr. N. D. Riley, Keeper of the Department of Entomology, British Museum (Natural History), and Mr. F. Barnett of the same Department for their, unfortunately unsuccessful, efforts at obtaining a quantity of pepsin for me; and, lastly, to the John Innes Horticultural Institution for providing me with this substance.

—I am, etc.,

Imperial Institute of Entomology. F. I. VAN EMDEN.

SIR,—I was most interested to read Dr. D. S. Sharpe's account of a case of intestinal myiasis caused by the larva of *Ptinus tectus* (Jan. 11, p. 54). I am, however, startled by his implication that the larva of *Ptinus tectus* is insectivorous, and I should be glad to know which insects normally form the food for this larva.

I feel also that Dr. Sharpe may be adding to the anxieties of parents by his lurid threat of intestinal myiasis to those children who eat fallen fruits. The only dipterous families which are likely to infest fruits attractive to even the most omnivorous (or insectivorous?) child are the Trypetidae or the Drosophilidae, and, so far as I am aware, no member of these families has so far been incriminated with causing myiasis. The adults of the Muscidae and the Calliphoridae—the myiasis-causing species *par excellence*—certainly feed on fermenting fruit, but I think they prefer a rather more decayed pabulum for breeding purposes.—I am, etc.,

Lagos, Nigeria. P. J. L. ROCHE.

Control of Measles

SIR,—After a depressing week-end of Arctic weather, snow shifting, and fuel crises (national and domestic) it was a welcome relief to open the *British Medical Journal* and read the three leading articles (Feb. 8, p. 225). The first of these ably reviewed the present position with regard to the control of measles, a very topical subject; the second set out clearly the reasons why a severe outbreak of influenza is unlikely this winter; while the third had the significant title "The Minister Accepts."

I found myself in general agreement with the opinions expressed in the article on the control of measles, but would like to make one or two comments with regard to the availability and use of convalescent measles serum, normal adult serum, and gamma-globulin. The last is at present unobtainable, while convalescent measles serum is in my experience a very rare product indeed; but adult normal serum could and should be readily available for the use of any doctor requiring it.

From the beginning of this year Leeds doctors have been able to obtain adult measles serum through the Public Health Department. The supply is obtained by arrangement with the Regional Blood Transfusion Service, who kindly carry out the necessary bottling and undertake the essential tests. The few weeks that have elapsed since the inauguration of this scheme have already proved its value, and in addition to numerous inquiries from doctors within the city there have been several requests for serum from areas outside the city and two from as far afield as Newcastle, so that it would appear that as far as the north-east of England is concerned the facilities for obtaining this product either do not exist or are not sufficiently well known. In this latter respect the statement in the leading article that normal adult serum is available from most of the constituent laboratories of the Public Health Laboratory Service was news to me, and I am sure it would be helpful if further publicity could be given to this source of supply.

I have found that some confusion exists as to the use of adult serum for attenuation. In one or two instances the serum has been given to the case rather than to the contact. Claims have been made as to the value of convalescent and adult serum in the treatment of a case of measles, but these have not been substantiated. When using adult serum for prevention the usual dose recommended is 10 ml., and this should be given to the

contact not later than the day of the appearance of the rash in the infecting case. If used for attenuation the same dose of 10 ml. should be given to the contact on the 4th, 5th, or 6th day after the appearance of the rash in the infecting case.—I am, etc.,

Leeds. J. F. WARIN.

National Health Service Act

SIR,—It is with diffidence that I enter the controversy on the National Health Service Act. It would appear that everything has already been said many times over on either side. However, it seems to me that the minority who voted "Yes"—a minority that was nearly 50%—should be more often represented in your columns. I particularly disagree with the claim made by so many of your contributors that opposition to the Act is not based on politics, or, at any rate, on party politics. Personally I am not a Socialist and have never voted for any party, and, considering the complete political unreality of so much of the argument, it is obvious that most medical men are not actively engaged in political life. Nevertheless, how many are there of those opposing the Act who do not cast their vote for a Conservative at an election? Professionally and socially we are predominantly Conservative and are naturally suspicious of a Labour Government and antagonistic towards its efforts. The people of this country, however, elected that Government with an overwhelming majority in Parliament. It is idle to pretend there was not a widespread determination to obtain social security, and votes were given to a party that could be trusted sincerely to support it. That was the working of democracy. Is it democratic for a section of the community to oppose the wishes of the majority as expressed in an Act of Parliament? Is it not dangerous to suggest that an organized professional body should try to make an Act unworkable in order to change it? Are we going to support miners or transport workers who might try to do likewise?

The Act sets out to effect a revolution—that no longer will poverty and lack of means be a bar to obtaining the best medical facilities and treatment available. Revolutions always disturb established customs. Such a great social advance cannot be made without some risks and disadvantages. Let us remember the advantages it will gain for our patients and potential patients, and be particularly careful that we are sincere when we claim to oppose the Act on behalf of our patients. When we complain because in time of scarcity extra amounts of rationed tit-bits are refused to a dying man who can afford them, it is well also to remember those who have been condemned to death or persistent ill-health through inability to afford necessary medical treatment.

It is for the individual doctor eventually to decide whether to enter the Service or not, but the recent plebiscite has finally destroyed the claim for unity within the profession. A large proportion of doctors, especially the younger ones, are willing to build up the best possible medical service on the present Act. Alterations in medical practice are part of wider social and economic changes hastened on by the war and are inevitable. The inherent danger of bureaucracy can be defeated by the efforts of those determined to make the Service successful. It is therefore to be hoped that in the coming negotiations the profession's representatives will display the utmost statesmanship and realism. Could the Minister be blamed for having failed to discuss previously the Act with a body so out of step with the times that it opposed a medical service covering 100% of the population? The Act is now on the Statute Book and we have our last chance to offer expert advice in clothing its bare bones.—I am, etc.,

Tunbridge Wells, Kent. D. G. ff. EDWARD.

Freedom of Choice

SIR,—We are most of us concerned with the imminent prospect of State control and of course hold freedom of choice of doctor by patient to be essential. Just how much freedom of choice the patient will have may be surmised from the following recent example. Mr. A is a non-industrial Civil Servant. He is an insured person and is under treatment by me for severe thrombo-phlebitis of leg. A few days ago he received from his department—namely, the Assistance Board—a letter stating that his case had been referred by them to the Treasury medical adviser—*the object of this being to enable remedial action to be taken.*

The Treasury medical adviser directs the Assistance Board to obtain an independent medical report from Dr. B, who is a general practitioner in the same area as myself. Since Mr. A did not chance to select Dr. B for his own doctor, however, he is treated with scant courtesy by Dr. B, who, when informed of the complaint, refuses to visit him and insists upon his turning out and walking to the surgery with a thrombosed leg on dangerously ice-bound and snow-covered roads. Mr. A is then informed that he will probably have to attend again for a further report. All this happens without any notification to me as Mr. A's doctor or any report on his condition being requested.

To comment on this it may be summarized by saying that Mr. A, while under treatment by a doctor he wishes to attend him, is suddenly directed by the State as his employer to visit Dr. B, whom he does *not* wish to attend, so that the Treasury medical adviser, who has never seen him, may decide what treatment should be given. All this takes place in a most underhand way completely behind the back of his own doctor, who is neither consulted nor informed of what is going on. Now Mr. A cannot be simultaneously treated by two persons, so pursuing this to its logical conclusion either the State removes him from his own doctor, or, if he elects to continue treatment from his own doctor, it may threaten him with withdrawal of his salary. The most disturbing feature is that this is apparently standard procedure, the letter to Mr. A being a cyclostyled copy bearing the form number G46/200/779.—I am, etc.,

Greenfield, Lancs. R. S. HOLGATE.

Administrators of the Act

SIR,—There is one seldom mentioned side of the National Health Service which I hope our negotiators will not overlook: the method of appointing the whole-time medical administrators. Whatever the final form of the Service it is clear that considerable executive authority will be vested in the statutory councils, boards, and committees envisaged in the Act. They, however, will consist for the most part of part-time members, and therefore considerable discretion and authority must devolve on their senior permanent officials, who will include medical men. It is our concern to see that from the start the method of appointing these key officials avoids the worst features of bureaucracy.

In my view at least two conditions must be fulfilled: (1) All senior appointments must be advertised and so thrown open to the widest possible "field." (2) Selection to medical appointments must be made by bodies on which there are representative medical members. This could be done peripherally by the body for whom the candidate is going to work or centrally by the Central Health Services Council. Any system which makes these appointments plums with which to reward long and faithful service in the existing medical administrative departments will, I am certain, prejudice fatally the prospect of getting a smoothly running service. Moreover I fear that unless we take steps to ensure the contrary this is the method of appointment that is likely to be applied.—I am, etc.,

Plymouth. T. A. A. HUNTER.

Remuneration under the Act

SIR,—Now that discussions have begun between the Negotiating Committee and the Minister may I draw attention to a fundamental point hitherto overlooked? It is the method of remuneration by capitation fee—surely one of the worst evils of the N.H.I. scheme and now, alas, threatening to be an even bigger evil in the future comprehensive Health Service. I think I am right in saying that the majority of doctors, like other members of the community, prefer to be remunerated in accordance with the amount of work they do. Conversely they do not wish to be paid for anything they have not done. Nor is this feeling confined to the doctors; it is shared by patients many of whom feel, when they need attention, that they have to apologize to their panel doctor for bothering him. How different many patients would feel if they knew their doctors were being paid on a *pro rata* basis for their time and trouble. As an example, with the best intentions in the world, human

weaknesses being what they are, there can be little doubt that a night call several miles into the country is done less grudgingly and more efficiently if there is a commensurate reward. It is the all-important incentive that counts.

For the future Health Service I strongly advocate a system of *pro rata* remuneration by the State on the lines of the familiar Form 1667, payment of civilian medical practitioners by the Service departments. The additional clerical work involved would in my opinion be more than worth it, and no doubt the Minister could devise some method of ensuring that all claims were *bona fide*.—I am, etc.,

Launceston, Cornwall. R. J. HEALEY.

Negotiating Committee and Consultants

SIR,—When a specialist who has been on the staff of a hospital reaches the age limit for that particular hospital—usually 65 years, sometimes less—he is generally "promoted" to being a "consultant," and while he ceases to carry out any routine work at the hospital he by no means always ceases to carry on his private consulting work. So far as it is possible to judge, the State Medical Service will deprive such consultants of most, if not all, of these patients.

There appears to be no provision in the Act for any compensation to these men for the loss of their practices—often increased, owing to having more time to give to them, and carried on for a number of years after their retirement from the hospital staff. There must be a very large number of such specialists in many branches of the profession in practice today, and I suggest the Negotiating Committee should insist that one of the numerous Regulations which undoubtedly will be made shall ensure a pension or compensation of some sort for these men, unless of course the State is willing to take them into its service—unlikely on account of age.—I am, etc.,

Norwich. ARTHUR GREENE.

Medical Certification

SIR,—The incursions of the bureaucrat into our professional freedom increase apace, and I am gratified that you have found space in the *Journal* of Feb. 15 (p. 268) to give vent to the protestations of Dr. Basil S. Kent against the personal data required by the Board of Trade before it issues a permit for the acquisition of a "thermos" flask. While I agree wholeheartedly with the stand taken by Dr. Kent I regret that he did concede the diagnosis in the case of his particular patient.

A few months ago I had a similar, if more protracted, correspondence with the Board of Trade which, for the sake of brevity, I summarize:

May 4, 1946. Myself to Board of Trade. Point out that a medical diagnosis is a matter of strict confidence between patient and doctor and request text or content of any Regulation requiring a doctor, after he has certified that in his opinion a patient requires a "thermos" flask, to submit his diagnosis for the approval of a lay official before such flask can be obtained. May 6, 1946. Reply from B. of T. Agreed that medical diagnosis is a matter of confidence but require certification that flask required for health reasons. May 7, 1946. Myself to B. of T. Point out that no doctor is going to act merely in the capacity of a rubber stamp, automatically endorsing applications for flasks, say, for picnic purposes, and that a medical certificate is for nothing but health reasons. May 10, 1946. Reply from B. of T. Permit for flask granted to patient, as it is gathered from my last letter that it is required for health reasons. Would be appreciated if, on future certificates, this additional information could be given. May 17, 1946. Myself to B. of T. after a certificate to another patient had been turned down because of omission of the vital words "for health reasons." Reiterate that medical certificates are only issued for reasons of *ill-health* and not for flippant reasons. Suggest that a little less red tape would save paper, postage, and manpower hours for the B. of T. as well as spare a busy practitioner a lengthy correspondence. Stated that I expected my original certificate to be honoured. May 21, 1946. Reply from B. of T. Permit granted. Stated that it would save the man-hours which I mentioned if on future certificates I included the necessary words "for health reasons."

What can one do, Sir, in the face of such obduracy? Incidentally, I believe that "thermos" flasks were on sale indiscriminately at a local ironmongers at the same time.—I am, etc.,

Huddersfield. LESLIE BALLON.

The Spens Committee

SIR,—It is to be hoped when the Spens Committee issues its report that it will be couched in terms which can be understood by any trade unionist. The more obvious details such as wages, hours of work, and holidays are not likely to be overlooked, but there are more recondite matters which will require the exercise of the most precise judgment and discretion if discontent within the profession, leading to "ca' canny," "working to rule," and strikes, is to be avoided. The possibility of claims for "bending-money" from the obstetricians, "stretching-money" from the orthopaedists, "danger-money" from the syphilologists, "dirty-money" and "wet-money" from other departments which I shall not specify are only a few of the examples which could be given.

Remuneration on a sessional basis presents peculiar difficulties of its own. Is the pace to be that of the slowest? If so, production per man hour will suffer. "Time-studies" would have to be introduced to avoid unfairness and consequent bad feeling. The good sense and dignity of the profession would be adequate to prevent cries of "No stop-watches here!"

Then there are degrees of skill and length of experience which will require their own assessment and reward. Surgical operations will have to be priced individually, otherwise the craftsmen who do lengthy operations will be able to take more home in their pay packet each week than, say, the ophthalmic surgeons. A careful delimitation of the various regions of the body will have to be carried out in order to avoid the unseemly disputes with regard to spheres of influence which are already arising. Rewards in kind, such as extra food and nylon stockings, may have to be provided in order to maintain the supply of men in the more tedious and unpleasant specialties, such as post-mortem work.

The cost of production of a doctor is a point which may have escaped the notice of the committee, and I only touch upon it briefly in order to point out that it has been calculated by Socialist writers that the expense of training a doctor would be amortized over his working life by an increase of 5% above the wage of an unskilled labourer. This, of course, leaves out the question of ability, but it should be remembered that in a Socialist State there would be little "rent of ability" allowed, the principle being: "From each according to his ability, to each according to his needs."—I am, etc.,

Bournemouth. T. R. AYNSLEY.

Behcet's Syndrome and Vitamin K

SIR,—Dr. E. W. Prosser Thomas's very interesting article (Jan. 4, p. 14) on this very serious and intractable complaint and Dr. G. Whitwell's letter (Feb. 1, p. 197), in which he states, "In view of the utter uselessness of all treatment up till now any therapeutic measure would be welcome. The peculiar sensitivity of the skin would suggest a trial of 'benadryl' . . ." have prompted me to send a brief account of a very severe skin condition occurring in a friend of mine who had been treated over a period of 3½ years by a competent G.P. and three consulting dermatologists without any amelioration of his symptoms.

It was a case of seborrhoeic dermatitis of scalp, forehead, face, neck, limbs, and hands in which pin-point pustules as described by Dr. Prosser Thomas developed like emboli, the inflammation of one closing the left eye. There were in addition indigestion and intense sensitivity of the skin to light, heat, and cold, and also to drugs such as sulphur and salicylic acid. Beyond some deterioration of sight there was no sign of gross eye lesions nor ulcer of the scrotum or aphthae of the mouth, so I do not know whether this was a case of Behcet's syndrome or not; but in view of Dr. Whitwell's remarks quoted above I should like to draw attention to the fact that after the failure of penicillin, injections of colloidal manganese, desensitization by mag. sulph., colloidal sulphur, vitamins A, B, C, D, nicotinic acid, thyroid, and ephedrine, there was a dramatic cessation and disappearance of the pin-point pustules and consequent easing of the intolerable itching when I gave him a course of "acetomenaphthone" (vitamin K analogue) 10 mg. once a day by mouth. But this drug had no appreciable effect on the dry scaly seborrhoea, which, however, yielded to shampoos and weak concentrations of ung. hyd. nit. dil. and olei cadini.

In the *Practitioner*, 1946, **157**, 391, Dr. D. M. Evans commented in a very valuable article on the benefits he has observed in skin and other diseases from the use of vitamin K analogue, and recently in "Any Questions" in the *Journal* (Jan. 11, p. 77) your expert stated that vitamin K seemed "to exercise a beneficial effect in some cases of perniosis—and this was borne out in the case I am recording where the patient said his cold feet were warmer after taking the drug. May I therefore suggest that vitamin K analogue should be given a trial in Behcet's syndrome and the result of such treatment recorded.—I am, etc.,

Paignton. A. J. AMBROSE.

Vitamin H

SIR,—In a recent paper some preliminary observations were reported about the relationship of premature alopecia and biotin by Chavarria *et al.*[1] In Costa Rica a nutritional deficiency syndrome was studied by them during the last three years which appeared only in children and never in adults. Similar changes were described in Africa under the name of kwashiorkor[2] or infantile pellagra,[3-8] but they were apparently considered manifestations of other deficiencies. The hair changes in Costa Rican children consisted of dryness, fragility, and loss of colour; the hair became loose and easily and painlessly pulled out, leading to calvities. Concurrently depigmentation of the hair varying from slight greying to intense whiteness occurred. The children often presented other deficiency symptoms such as: follicular keratosis, seborrhoeic-like dermatitis, occasionally diarrhoea, generalized oedema with normal content of blood proteins and hepatic cirrhosis, glossitis, and angular stomatitis. The diet of the affected children consisted chiefly of bananas and molasses.

Unless the patient died shortly after admission the ordinary hospital diet effected a cure. An addition of 0.25 mg. of biotin to the diet twice or three times a day appeared to accelerate the return of both pigment and growth of hair more quickly than the addition of thiamine, nicotinamide, and other vitamins.—I am, etc.,

London, W.1. Z. A. LEITNER.

REFERENCES
1 *J. Amer. med. Ass.*, 1946, **132**, 570.
2 *Arch. Dis. Childh.*, 1933, **8**, 423.
3 Ibid., 1937, **12**, 193.
4 *Trans. roy. Soc. trop. Med. Hyg.*, 1940, **33**, 389.
5 *S. Afr. J. med. Sci.*, 1943, **8**, 106.
6 *Nature*, 1944, **154**, 148.
7 *Arch. Intern. Med.*, 1945, **76**, 63.
8 *J. Amer. med. Ass.*, 1945, **129**, 12.

Pellagrous Encephalopathy

SIR,—I was interested in Dr. P. R. Graves's account (Feb. 15, p. 253) of pellagrous encephalopathy occurring among prisoners of war in Singapore. In our camp at Palembang, Sumatra, we had a similar syndrome, but had many more acute coma cases. These occurred mainly in the last three months of captivity, when the basic rice ration was 200 grammes per diem, with very little vegetable and practically no protein foodstuffs. Most of the acute cases had previously shown well-marked signs of pellagra and were all greatly emaciated. Some went from the ambulant stage into coma in the space of hours, and on occasion a man failed to report at the morning roll-call as he had in fact gone into a coma overnight in his billet. All showed quadriplegic rigidity, but I cannot remember any case which had convulsions. We were able to perform only one or two necropsies and these very much *sub rosa*. It was possible to examine the brain *in situ* only. The hemispheres showed generalized oedema, but apart from that little else was noted, and it was not practicable to open the abdomen.—I am, etc.,

Devonport. J. P. CORCORAN.

Intravenous Procaine (Novocain)

SIR,—More is known about the effects of intravenous procaine (novocain) than is suggested in the reply to a question in the *Journal* of Feb. 15 (p. 282). Procaine has indeed quinidine-like actions on the heart which can prevent the development of auricular or ventricular fibrillation in experimental animals. Since, however, this action can only be produced on intravenous injection, and probably only by doses that cause central nervous side effects, it is not likely to be of much therapeutic value.

Procaine has also been given by intravenous infusion for the relief of pain due to burns (Gordon, R.A., *Canad. med. Ass. J.*, 1943, **49**, 478), for the relief of the pain of labour (Allen, F. M., *Amer. J. Surg.*, 1945, **70**, 283), and for sundry other types of pain and in the relief of pruritus (Lundy, J. S., *Clinical Anaesthesia*, Philadelphia, 1942). It has been suggested that this analgesic effect is due partly to a local action on a traumatized area, where increased capillary permeability would allow greater amounts than normal to escape from the blood, and partly to an action on the central nervous system. For this purpose procaine has been given intravenously in doses of up to 5 g. in 1½ hours.

It is important to realize that the toxicity of intravenous procaine is very closely related to the speed of injection, since the compound is rapidly detoxicated, partly by an enzyme in the blood (called "procaine esterase" by Kisch, Koster, and Strauss) and partly by a similar enzyme in the liver. The procaine is hydrolysed to para-aminobenzoic acid and diethylamino-ethanol, neither of which has the typical peripheral or central actions of procaine. If the rate of infusion exceeds the rate of breakdown the blood level of procaine will rise steadily, and toxic effects such as convulsions and respiratory failure will finally occur. Tachycardia usually appears when procaine is injected at rates exceeding 2 ml. per minute of a 1% solution (20 mg. per minute) and becomes marked when rates of over 5 ml. per minute (50 mg. per minute) are given. It is claimed that the convulsive action of procaine is prevented by premedication with barbiturates—e.g., pentobarbitone (1 gr. (65 mg.) by mouth).

The safety and value of intravenous procaine as an analgesic have not yet been adequately assessed; studies on this subject are in progress in my laboratory at the present time.—I am., etc.,

Department of Pharmacology, Middlesex Hospital Medical School, London, W.1. C. A. KEELE.

SIR,—With regard to the question (Feb. 15, p. 282) on intravenous novocain (procaine) dosage, it may be of interest to mention some unpublished facts on this subject. The writer has now administered procaine by vein in 48 cases, mainly for post-operative pain in place of morphine. The routine dosage has been 1 g. in 0.2% solution given over a period of 60–70 minutes. No deleterious effects have been noted and in general satisfactory analgesia has been obtained without the dangers of post-operative respiratory depression. This analgesia persists for as long as four days in some cases and its action is by no means clearly understood. Further investigations are at present being undertaken to determine effective blood levels consistent with safety and the mechanism of action of generalized procaine effects.

In addition to its analgesic effect intravenous procaine has a mild cerebral excitatory action which is beneficial in many post-operative cases. This effect may be very easily controlled by barbiturates, which have the further advantage of increasing the minimum lethal dose of procaine fourfold (Goodman and Gilman).—I am, etc.,

London, W.12. E. J. DELORME.

Endocrine Receptors

SIR,—We have to be grateful to Dr. S. L. Simpson (Feb. 15, p. 270) for standing up in defence of endocrinologists who paid attention to the "endocrine receptors" discussed by Mr. Aleck Bourne (Jan. 18, p. 79) in view of your statement in the editorial review in the same number (p. 96).

Due tribute should be paid, however, on this occasion to Prof. Julius Bauer, of Los Angeles, California, formerly of the University of Vienna, who based his teaching of endocrinology on this assumption as long ago as 1917.[1] The piquancy of the situation is the fact that in the summary of his works, *Constitution and Disease* (Wm. Heinemann, London, 1942), he devoted a whole chapter to the discussion of this question (p. 53). The book was extensively reviewed in your leading article of April 24, 1943 (p. 510), from which I quote: "Like H. H. Dale, he [Bauer] emphasizes the importance of the receptivity of the organ to hormonal stimulus, which explains cases where the endocrine lack is expressed in only one organ." In a previous paper[2] Bauer explains the manifold activities of the pituitary hormones in this way.

Rediscovery of thoughts, teachings, and facts is by necessity more frequent as medicine and biology become more complex. It is to be hoped that the *World Abstracts* will be effective to cut down such occurrences to a minimum.—I am, etc.,

V. C. MEDVEI.

REFERENCES

1 Bauer, J. (1917). *Konstitutionelle Disposition zu Inneren Krankheit*, Berlin.
2 —— (1936). *Wien. klin. Wschr.*, **49**, 504.

Gynaecomastia

SIR,—I was very interested to see that Dr. Stephen D. Sturton (Feb. 15, p. 269) calls attention to the enlargement of the breasts so often seen in male lepers. The condition was described in a book on tropical fevers by Dr. Kauntze, *C.M.G.*, and myself, published in 1931 by Ballière, Tindall and Cox, and a photograph of a leper in Kenya Colony with this condition can be seen in the text.—I am, etc.,

N. P. JEWELL.

Pinner, Middx.

Trilene in Labour

SIR,—Mr. D. M. Stern (Feb. 1, p. 199) has stressed the dangers of using trilene for caesarean section. Many hospitals and clinics are unfortunately still not equipped with machines available for use with cyclopropane, partly because there are not sufficient fully trained anaesthetists to administer it and partly because old-established methods die hard, by which I mean the gas-oxygen-ether sequence. As there is often a cardiac or pulmonary indication for the use of cyclopropane in this operation, I consider that authorities should make it their duty to install such an apparatus and a suitable anaesthetist to administer it.

Preliminary narcosis with morphine and hyoscine is admittedly inadvisable, and therefore where cyclopropane is unavailable I suggest that the following technique should be adopted. Atropine is the only premedicant. A "sleep" dose of pentothal is administered with the patient on the table and the needle left in the vein. Gas, oxygen, and trilene is then induced, and only minimal doses of pentothal administered intermittently until the baby is born. Tachypnoea and cyanosis are avoided, and more pentothal can be given after the baby is born to reduce respiratory excursion and allow the operation to proceed unhurried and unhindered.

Should tachypnoea prove troublesome or the dose of pentothal seem excessive resort can be gently made to vinesthene or even ether. Cyclopropane is undoubtedly the method of choice, but in its absence the above technique in my experience has proved safe and reliable in a large series of successful caesarean sections. The secret of success would appear to be the judicious and controlled use of a combination of pentothal with gas, oxygen, and trilene.—I am, etc.,

W. M. MAIDLOW.

Bristol.

SIR,—Having seen Mr. D. M. Stern's letter (Feb. 1, p. 199) dealing with trilene anaesthesia for caesarean section, I have tabulated some of Dr. F. F. Waddy's anaesthetics, the notes of which cover all such cases performed at the General Hospital, Northampton, which were anaesthetized by him, and operated upon by Mr. R. Watson between Nov. 30, 1942, and Dec. 16, 1943—about thirteen months. From these figures it is not possible to agree with Mr. Stern's assertion that trilene with nitrous-oxide anaesthesia is harmful—let alone dangerous—to either the mother or to the infant, in this type of case.

Maternal age range 19 to 47; average maternal age 32; maternal mortality 0; infant mortality 3 (5.3%); one stillbirth, one asphyxia, one unknown. In this series, 57 caesarean sections were performed. There was one twin pregnancy, and one stillbirth in which the foetal heart could not be heard prior to the operation. The state of infant at birth was good in 26 (44.8%); satisfactory in 10 (17.2%); fair in 3 (5.2%); white asphyxia in 10 (17.2%); blue asphyxia in 4 (6.9%); stillborn in 1 (1.7%); and unclassified in 4 (6.9%) cases. The classification of the infants has been left to that one of the three sisters-in-charge present at the operation. However, it is worthy of note that of the above 58 infants 54 were stated to be normal within ten minutes of delivery. Further, about 40% of these patients were suffering from conditions that were prejudicial to anaesthesia. These were divided as follows: Toxaemias 6 (10.5%) (of the total); A.P.H. 9 (15.8%); heart conditions 5 (8.8%); chronic bronchitis 2 (3.5%); bronchiectasis 1 (1.7%); and spinal tuberculosis 1 (1.7%).

The state of the infant at birth in these cases was:

Mother	Infant						
	Good	Satis.	Fair	White	Blue	Died	Unknown
Toxaemias ..	2	2	0	1	1	0	0
A.P.H.	3	1	1	3	0	1	0
Heart	2	2	0	0	0	0	1
Others	1	0	1	0	0	1	0

It can be said that not one of the mothers showed any symptom that would point to trilene with nitrous-oxide being a dangerous anaesthetic for caesarean section. Their condition was recorded as good in 48; fair in 7; and unrecorded in 2 cases. Thirty-two mothers had some anaesthetic sequelae with headache in 3; nausea in 18; excess nausea in 1; vomiting once in 23 (none vomited more than once); and restlessness in 12 cases. One mother had post-operative bleeding—and she had had an A.P.H.—and she made a perfect recovery after a blood transfusion the amount of which is not, unfortunately, stated in the records. The premedication given to these patients was nearly always atropine 1/100 gr. (0.65 mg.) and strophanthin 1/200 gr. (0.32 mg.).

In direct answer to Mr. Stern's assertions I can say that in this small number of cases there was no maternal death; no evidence of damage to either the nervous system or to the liver; and that not only was there no sign of damage to the conduction system of the heart, but that in the five heart cases operated upon not one was made any worse by the anaesthetic or the operation. Since the above dates, the majority of cases at this hospital have been dealt with in the same manner with similar results, but the records are not so readily available.—I am, etc.,

J. STRUAN-MARSHALL.

Northampton.

Ruptured Aneurysm of Right Auricle

SIR,—The following condition is, as far as I know, extremely rare. I am reporting it so that it will go into record.

A healthy man suddenly dropped dead in the middle of a minor fight with another man. The body was brought for post-mortem examination. On opening the chest the pericardium was found to be full of blood. This came from a ruptured aneurysm of the right auricle. The whole heart was removed and examined. In addition to the aneurysm of the right auricle there was dilatation of an already thinned ventricular myocardium. The valves and aorta showed no sign of atheroma, syphilis, or rheumatism. There was no fibrosis in the myocardium. The auricular myocardium had atrophied and in the thin aneurysm area there were only shreds of muscle over endocardium with abundant spaces of the latter not covered by muscle. The liver was enlarged to about three times its normal size. The man was about 30 years old.

I am not sure if ruptured aneurysm of the right auricle has ever been reported before. The specimen is now in the museum of the Kitchener School of Medicine, Khartum.—I am, etc.,

H. ABDALLA.

Juba, Sudan.

Shortage of Nurses

SIR,—Your review of Dr. James Barclay's book *Why No Nurses?* prompts me to write this letter. I have for many years looked after our nurses when sick, lectured to nurses, served on hospital nursing committees, and have been for some ten years an examiner in anatomy and physiology to the General Nursing Council. The position as regards nursing is very serious already and, unless something revolutionary is done, is bound to get much worse.

It seems supremely unlikely that any of those at present organizing the nursing profession have the vision to do anything revolutionary. They still have the vocational complex plus plus plus. Now I am not going to suggest that matron's discipline should be relaxed. A nurse's work is very arduous: she is exposed to extra risks of ill-health, and she cannot be allowed to go racketing about half the night. However, there are still some obvious means of improving things. (1) Nurses on the whole are not getting the 48-hour week or 96-hour fortnight. (2) It is mortifying for a qualified staff nurse

to find she is being paid at the same rate as a ward maid. (3) The care of nurses is left far too much to matrons. The hospital committee should supervise the matron's work by appointing at least one member of the medical staff and a lay member of the board and governors, who should meet the representatives of the nurses at least quarterly and hear their complaints and suggestions. (4) Matrons should *never* be allowed to remain in one hospital more than five years.

These measures should lead to a gradual improvement, but drastic steps must be taken to rapidly increase recruitment. It is universally admitted that the hiatus between the school-leaving age and the age that a girl can start nursing loses thousands of recruits yearly. A girl who is earning a good wage and has regular hours and freedom after work is not likely to take up nursing and its restrictions. Only the very keen and the relatively unemployable will become recruits. Apropos of the latter it would be incredible, if one had not suffered it for years, how large a percentage of the candidates for the Preliminary Examination ought never to have been accepted as probationers. Their chances of ever qualifying are nil, and they are only fit for the most menial jobs. One cannot blame the matrons who accept them; it is that or nothing. One cannot blame their tutors; they are unteachable.

Now there is an obvious remedy. It is an expensive one, but nurses are *essential*. I would insist that from the earliest school-days girls are interested in nursing; one or two hours a week they dress up in nursing uniform with a red cross, and are given bandaging lessons with dolls and lessons in bed-making, etc. As they get older they would have lectures explaining to them how being nurses would teach them personal hygiene, cooking for the sick, preventive medicine, the care of their children, etc. In their pre-leaving years they would be examined. Successful candidates leaving school at 15 would become paid pupils of the State and attend special schools. They would pass examinations each year and be eliminated and passed on for another year.

Before they reached their eighteenth year they would have passed their Preliminary Examination and would enter on their hospital duties proper completely untrammelled by the subjects of anatomy, physiology, and hygiene, and would be able to concentrate at once on real nursing. I submit that on these lines the nursing profession would be reborn and over-subscribed.—I am, etc.,

Great Yarmouth, Norfolk. LEONARD LEY.

Sarcoma in Intra-abdominal Testis with Torsion of Pedicle

SIR,—I was interested to read the report of Drs. A. H. Bennett and W. G. Shaw (Feb. 15, p. 256) of a case of ectopia testis with seminomatous change and torsion. The coincidence of the triple pathology must be very rare. I am therefore prompted to record an almost exactly similar case that I encountered in 1931 in Singapore. Unfortunately my notes of the case were lost owing to the Japanese occupation of the country, but the facts, briefly, were these.

A young adult male was admitted with abdominal pain of sudden onset, and no testis was present in the right side of the scrotum. Laparotomy showed a haemorrhagic peritoneal exudate and a dark plum-coloured globular tumour the size of a fist with tightly twisted narrow pedicle arising from the right side of the pelvis. It looked exactly like a twisted ovarian cyst. Excision. Recovery. Later history unknown.

The pathologist's report in this case stated that the tumour was a sarcoma in an intra-abdominal testis with torsion of the pedicle.—I am, etc.,

London, S.W.1. E. C. CHITTY.

Persistent Anaemia in a Breast-fed Infant with Erythroblastosis Foetalis

SIR,—It is worth while underlining Dr. Rosemary Davies's case report published in your issue of Jan. 25 (p. 138). I will be absolutely brief in deference to your inevitable shortage of space, but the point in question is by no means well known. Eighteen months ago I also saw a child, born jaundiced, with erythroblastosis foetalis. Transfusions had to be continued owing to persistent fall in the red cell count until at the age of two months the breast milk was tested and found to contain anti-Rh agglutinins. Cessation of breast-feeding brought the haemolysis and the need for further transfusions, seven having been given, to an abrupt end.—I am, etc.,

Edgware, Middx. F. HARWOOD STEVENSON.

Obituary

G. O. LAMBERT, M.D., F.R.C.P.

Dr. Gordon Ormsby Lambert, of Reading, died at the age of 69 at Bucklebury, Berks, on Jan. 26 after a short illness. He had had an active and distinguished career and had only recently retired from practice. Educated at Lancing and at St. John's College, Cambridge, where he took his B.A. degree in 1898, he completed his medical training at Charing Cross Hospital, qualifying M.B., B.Ch. in 1901. After holding various house appointments at his own and at other hospitals he came to Reading early in the present century, and proceeded M.D. in 1906. He was appointed medical registrar to the Royal Berkshire Hospital in 1913, assistant physician in 1914, and physician in 1923. In 1942, after being senior physician for many years, he was elected F.R.C.P. The same year he retired from the active staff of the hospital, though still holding the post of cardiologist, and was made a consulting physician. His private practice, however, he continued until his recent retirement. Dr. Lambert's services were much in demand in the district as a consultant in medicine, of which he had a very wide knowledge. He was a good diagnostician and most conscientious over his work, which he took very seriously; no one could have surpassed him in the thoroughness of his examinations. He rarely missed anything. Some may have thought that occasionally his treatment was rather overabundant in its many details, but it was based on scientific reasoning and he was in no wise biased against surgical assistance, if he thought it necessary or even remotely helpful. He had a most unselfish character and was always kind and considerate. Dr. Lambert contributed a number of articles to the medical press, chiefly on cardiac conditions, in which he was particularly interested. He was at one time joint editor of the Royal Berkshire Hospital Reports. Philosophy also attracted him; he was the author of a booklet recently published, entitled *Happiness in a Modern World*. He was twice president of the Reading Pathological Society and had been a member of the British Medical Association since 1912. He was president of the Reading Division in 1931-2. In addition to his professional work he at one time took some part in local politics, and was for four years a member of the town council. It is sad to think that after so long a time spent in the service of others Dr. Lambert should not have been spared to enjoy the quiet country life that he had looked forward to and had only just begun to taste.—W.B.S.

JOHN WALLACE, O.B.E., M.B., C.M.

By the death of Dr. John Wallace on Feb. 13, Weston-super-Mare has lost its oldest medical practitioner. Dr. Wallace was born in Fife in December, 1856, and although in his ninety-first year he was such an exceptionally vigorous man that he was able to continue his practice and other interests until a few days before his death. While he was a first-year student at Edinburgh University his father died suddenly and young Wallace had to return home to manage the family farms. He remained engaged in farming and stock-breeding and raising until 1885, and to learn business methods he served a year in the office of a chartered accountant in Edinburgh. In 1886 he married and with his wife spent two years in Italy, Germany, and France studying forestry and dairy farming.

It was not until he was 30 that he decided to take up again the study of medicine. He was probably influenced in this decision by his younger brother—afterwards Sir David Wallace and a well-known surgeon in Edinburgh—who had already qualified. He returned to Edinburgh University, graduated M.B., C.M. in 1892 and obtained the B.Sc. (Public Health) in the following year. After a period as assistant to Sir Henry Littlejohn, the medical officer of health for Edinburgh, further study at Berne, and some mental hospital experience, Dr. Wallace settled in medical practice in Weston-super-Mare in 1896, over fifty years ago. Here he quickly became a trusted family physician, but so great was his tireless energy and versatility that he successfully developed many other interests

He had an eminently legal mind and much financial ability—probably family traits, for one of his brothers established a well-known law firm in Edinburgh and became a director of the Bank of Scotland. For several years he was deputy to the coroner for North Somerset, and because of his extensive knowledge of medico-legal problems he was often consulted by his medical colleagues. He was a past president of the Bath and Bristol Branch of the British Medical Association, of which he had been a member for over fifty years. He opposed the medical provisions of the National Health Insurance Act of 1911, and was one of those medical men who interviewed Mr. Lloyd George on the subject. In 1911 he became medical officer of health for the urban district, and held this part-time office until 1929, when he was 73 years old. He did valuable work in connexion with the water supply; a new infectious diseases hospital; the erection in 1916 of the first public abattoir in the county; and the formation of the Tuberculosis Care Committee, of which he was chairman.

Dr. Wallace took an early and active part in Somerset's pioneer campaign for the control of mental defectives and the provision of a farm colony in the county; when the Somerset Committee was formed in 1914 he was co-opted as an expert member and remained a member for the rest of his life. His mental hospital and business experience led to his help being sought on the management committees of the various institutions as they were developed. From 1924 to 1946 he acted as medical visitor to the visiting justices for the private mental hospitals and institutions in the north of the county. When a voluntary war hospital was opened here during the first world war, it was placed under his direction, and he was deservedly awarded the O.B.E. for his distinguished services. During the recent war, when well over 80 years of age, he acted most efficiently as war emergency hospital officer for the area. As a business man he took a practical interest in the Moorland Sanitary Steam Laundry and was chairman of the directors at the time of his death.

He was a great sportsman, and his many hobbies included fishing, shooting, archery, beekeeping and golf. In his earlier years he was a scratch golfer and one of the founders and a past president of the Weston-super-Mare golf club. It was only comparatively recently that he gave up playing regularly there. He was truly a hardy Scot, and although he started work early and kept up to date by reading till the small hours, he was never known to be tired. Dr. Wallace had a forceful and colourful personality, and though some thought him a little austere he was really the kindest of men, a much-sought-after adviser, and in secret very generous to the needy and deserving.

JOHN B. H. HOLROYD, M.R.C.S.

Dr. John Brook Henderson Holroyd, who died in Sheffield on Feb. 8 at the age of 68, was a well-known figure in the medical life of the city. He entered the Sheffield Medical School in 1905, and qualified M.R.C.S., L.R.C.P. in 1910. He held a number of house appointments before settling in general practice in the Pitsmoor district of Sheffield.

He served in India and elsewhere as a captain, R.A.M.C., during the 1914–18 war. Dr. Holroyd had always been attracted to the administration of anaesthetics, and early in his career became one of the visiting anaesthetists to the Royal Hospital in Sheffield and was later attached to the Royal Infirmary in the same capacity.

In order to arouse the interest of the medical students in the study of anaesthesia his offer of an annual prize in the form of a gold medal was accepted by the faculty of medicine. The medal was awarded on the results of a competitive examination in the theory and practice of anaesthesia. Dr. Holroyd was one of the original members of the council of the Society of Anaesthetists at its inception in 1935 and was given the diploma. In 1942 he resigned from general practice and devoted himself solely to anaesthesia.

During the recent war he gave valuable service to the E.M.S. as an anaesthetist, and from October, 1939, to September, 1945, he acted as temporary lecturer in anaesthesia in the University of Sheffield. He devoted his energies unstintingly to the instruction of students in this important branch of their work. He also instituted the arrangement whereby every new resident at the Royal Sheffield Infirmary and Hospital had to give anaesthetics under the supervision of one of the honorary anaesthetists before being allowed to take a case entirely on his own. This arrangement has always been welcomed by new residents whatever their school.

With Jack Holroyd in charge of the anaesthetic, the surgeon's anxiety on that score was eliminated. He always gave due warning as to what might be attempted with safety and always carried on quietly and efficiently, starting all anti-shock therapy without bothering to wait until it was suggested to him. He visited each patient for a day or two subsequently and treated any complication due to the anaesthetic so far as he could. The relationship between him and the surgeon with whom he had worked for twenty-five years was a happy one. Each had the full confidence of the other. He was keenly interested in the development of anaesthesia and was always well abreast of the recent advances. He will be sadly missed by his colleagues.

The attendance at the service held in the chapel of the Royal Infirmary on Feb. 12 testified to his popularity as an anaesthetist and a man. For the last few months he had been ailing, but it was not until three weeks before his death that he gave up his work, quoting his favourite aphorism to one who had worked with him for many years: "It's a wise man who knows his own limitations."

W. H. DE B. HUBERT, M.R.C.P.

The premature death of Dr. William Henry de Bargue Hubert has robbed psychiatry of an unusual personality and one of its most astute clinicians. Hubert received his training in the specialty at the Maudsley Hospital under the late Prof. Mapother, who made no secret of his high opinion of Hubert's abilities and his belief that he possessed "a touch of genius." In 1934 he was appointed chief assistant to the department of psychological medicine at St. Thomas's Hospital, and after four years of outstandingly good work there was promoted to assistant physician in the department. About the same time he published, with Dr. Norwood East, a report upon the "Psychological Treatment of Crime," embodying the results of four years' investigation of this subject at Wormwood Scrubs.

On the outbreak of war he at once joined the R.A.M.C. and very shortly succeeded in joining his chief, Dr. Henry Yellowlees, who was already in France as consulting psychiatrist to the B.E.F. After the fall of France Hubert went to North Africa, where he spent more than three years, first as medical officer in charge of a division of the 41st General Hospital, and finally as adviser in psychiatry with the rank of lieutenant-colonel. His health suffered grievously under the stress and strain of those years, and the rest of his life, from his return to civilian work in 1945 until his premature and tragic death on March 5, was a struggle against illness the extent of which few of his friends realized. In addition to all the difficulties and anxieties of taking up the threads of civil life and work again and rebuilding a consulting practice he had much insomnia, repeated bouts of malaria, and in the autumn of 1945 an attack of coronary thrombosis. He remained cheerful and optimistic to the end, he was never heard to grumble or complain, and even when his state of health forced him to resign his post on the staff of St. Thomas's, only a few weeks before his death, he still looked forward to an active and busy life as a consultant.

In his early days Hubert had leanings to the Freudian school, but he forsook it because he thought it lacked practical relationship to the clinical work to which he was devoted. Child psychiatry became one of his special interests. As a shrewd diagnostician after a first interview with any psychiatric patient he had few equals. He had, perhaps unfortunately, a very large share of the artistic temperament. Anything humdrum or mechanical was an abomination to him and he found the routine and business side of a consultant's life something of a weariness. As an assistant and a junior colleague he was unsurpassed, by reason of his splendid loyalty, his unfailing good humour, and his astonishing readiness and resource. In more independent positions he tended to become the somewhat unpractical dreamer, but remained always a most charming companion with something intelligent, well-informed, and thought-provoking to say on almost any subject. He had many interests outside medicine. He was well up in astronomy,

played a good game of chess, and was a water-colour artist above the average. He had a most disarming quiet friendliness of manner, and, though he was not afraid of giving his opinions on controversial points, did so with such tact that he made very few, if any, enemies. But it was with individual patients that he was at his best by far, and it is as a loyal, cheerful colleague with a remarkable clinical flair that his friends will remember him.

Dr. DUNCAN MACDONALD died in Oban on Feb. 16 at the age of 74. Dr. MacDonald was the sole survivor of a family of ten. On his father's side he belonged to the MacDonalds of Dunnyveg and the Antrim Glens, while on his mother's side he was a great-great-grandson of James MacDonald of Skye, who was a brother of Allan MacDonald, of Kingsburgh, the husband of Flora MacDonald. Duncan MacDonald qualified M.B., C.M. in 1893 at Glasgow and proceeded M.D. in 1905. After two years in the County of Durham he was appointed medical officer for Torosay, Mull, where he remained for six and a half years. Dr. MacDonald went to Oban in 1901 in succession to Dr. MacKelvie and was largely instrumental in the founding of the county sanatorium there. He resigned his office as medical superintendent of the sanatorium early in 1943, after thirty-four years of devoted service to his patients. He also served on the staff of the West Highland Cottage Hospital, and during the first world war he was the honorary medical officer of Dungallon Red Cross Hospital at Oban. In 1943 his fifty years of practice was celebrated by a public presentation and a dinner. He retired a year later. Dr. MacDonald is survived by his wife and two sons.

Lieut.-Col. JOHN DU PLESSIS LANGRISHE died in Edinburgh on Feb. 28, at the age of 63. A grandson of the Rev. Sir Hercules R. Langrishe, of Knocktopher, Co. Kilkenny, he graduated in Dublin in 1906. He was awarded the D.S.O. in 1918, by which time he had had 12 years' service with the regular R.A.M.C. He commanded a field ambulance during the last two years of the war and was mentioned in dispatches. He took the D.P.H. in 1920 and thereafter served as D.A.D.H. in the Bermuda Command for three years, and at Catterick for a further three years. Leaving the Army in 1928 he became lecturer in the public health department of Edinburgh University. In his time a rugger "blue" and a very fine oar, he always actively supported the university team and crews.

The Services

The Queen of the Netherlands has bestowed the decoration of Officer in the Order of Orange Nassau upon Surg. Lieut.-Cmdr. C. G. Roworth, R.N.V.R., for outstanding services as senior medical officer, Anglo-Dutch Sick Quarters, Holyhead.

The following decorations have been bestowed by the King of Norway. *King Haakon VII Liberty Cross:* Surg. Capt. J. C. Souter, R.N., for services rendered to Norway during the war. *King Haakon VII Liberty Medal:* Surg. Cmdr. J. A. Kerr, R.N.V.R., for outstanding services in connexion with the liberation of Norway; Surg. Cmdr. W. Flynn, R.N., for services rendered to Norway during the war.

Major (now Temp. Lieut.-Col.) J. B. Bishop, R.A.M.C., has been awarded the Efficiency Medal (Territorial), 1st Clasp.

Major (Hon. Lieut.-Col.) R. G. Evans, M.B.E., Capt. (now Temp. Lieut.-Col.) J. B. Bishop, and Lieut. (Hon. Capt.) I. R. Rosekilly, R.A.M.C., have been awarded the Efficiency Medal (Territorial).

DEATHS IN THE SERVICES

Col. HARRY MALCOLM MACKENZIE, C.I.E., Indian Medical Service, retired, died on Feb. 25, aged 69. He was educated at Larchfield School, Helensburgh, at the Royal High School, Edinburgh, and at Edinburgh University, where he obtained honours in the M.B., Ch.B. examination in 1899. He entered the Indian Medical Service in 1900 and took the D.P.H., Cambridge, in 1903. Most of his service was in the North-West Frontier Province and in the Punjab. He saw active service throughout the War of 1914–18 and was awarded a star and two medals. In 1914-15 he went to Egypt on the hospital ship *Hardinge*. He was promoted to full colonel in 1929. In 1931–2 he held the important post of surgeon to the Viceroy and in the latter year was awarded the C.I.E. for his long and distinguished service. He published articles of medical and scientific interest in the *British Medical Journal* and had been a member of the British Medical Association since 1901. His recreations included golf, fishing, and shooting. He married Elfreda, daughter of A. A. Hudson, K.C., and had a son and a daughter.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The honorary degree of D.Sc. was conferred on Sir Edward Mellanby, K.C.B., M.D., F.R.S., Secretary of the Medical Research Council, in Congregation on March 15.

The following medical degrees were conferred during February and March.

M.D.—G. F. Barran, E. D. H. Cowen, J. F. Stokes, D. M. Baker, F. S. A. Doran, P. H. Willcox, G. H. Wooler, J. C. Waterlow, M. A. Rugg-Gunn, J. Aspin, A. P. Dick, C. C. Thomas.

M.B., B.CHIR.—*R. H. B. Mills, *M. E. E. White, *A. P. Baker, *D. O'Brien, *J. A. S. Forman, *T. C. L. Parry, *R. Marshall, *D. J. Watt, *A. Pines, A. G. Norman, *G. T. F. Braddock.

* By proxy.

Joseph Marks, M.B., B.S., and Edward Derek Huxley Cowen, M.B., B.Chir., have been elected to Frank Edward Elmore Fund studentships from March 1.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

A series of lectures in anaesthesia will be delivered at the College (Lincoln's Inn Fields, W.C.) from April 14 to 18 and April 21 to 25, at 6.15 p.m., and on April 28 and 29, at 5 p.m. The fee for the whole course is £5 5s.; Fellows and Members of the College and Licentiates in Dental Surgery will be admitted for £3 3s. Applications and cheques should be sent to the assistant secretary of the College. Details of the lectures will be published in the diary column of the *Supplement* week by week.

At an ordinary meeting of the Council, held on Feb. 13, with Sir Alfred Webb-Johnson, Bt., President, in the chair, Prof. Louis Bazy, of Paris, attended and was enrolled as an Honorary Member of the College.

The Hallett Prize for Anatomy, Applied Physiology and Pathology was awarded to H. J. Richards (University of Sydney).

Prof. F. Wood Jones was appointed Arris and Gale Lecturer and Dr. R. J. Last and Mr. H. F. Lunn Arnott Demonstrators.

Sir Cecil Wakeley was appointed chairman of the editorial committee appointed to control the publication of the forthcoming *Annals of the Royal College of Surgeons of England*.

Diplomas of membership were granted, jointly with the Royal College of Physicians of London, to P. J. Horsley, F. S. Huxley, and to the 96 successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Feb. 15 (p. 276).

Diplomas in Public Health were granted, jointly with the Royal College of Physicians of London, to the 32 successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Feb. 15 (p. 276).

Diplomas in Laryngology and Otology were granted, jointly with the Royal College of Physicians of London, to W. F. Dickie-Clark and R. T. Raymond-Jones.

The Council of the College invite applications for annual examinerships for the Fellowship, for the Licence in Dental Surgery, and under the Examining Board in England. Particulars and forms of application, which must be returned completed by March 31, can be obtained from the assistant secretary.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College, held on Feb. 4, with the President, Dr. D. M. Lyon, in the chair, Drs. Henry James Parish (Petts Wood, Kent), Robert Carmichael Wood (Edinburgh), and John Alexander Malloch (Edinburgh) were introduced and took their seats as Fellows of the College. Dr. William Alexander Liston (Edinburgh) was elected a Fellow of the College.

Drs. John Morton Henderson (Edinburgh), Nawab Ali (Bengal), Sujata Chaudhuri (Calcutta), Isidore Schrire (London), James Parlane Baird (Glenbuck), Charles Groves (Edinburgh), William Hunter (Edinburgh), Jacob Du Toit (Pretoria), Ralph Lulu Tobias (Cape Town), Andrew Campbell Watt (Edinburgh), Hamidali Mahbubali Khan (Poona), Roland William Riddell (London), Vera Sarah Emanuel (Johannesburg), Cecil Harris (Troon), Harland Cornelius Hastings (Edinburgh), and Alastair Robert Currie (Glasgow) were elected Members of the College.

ROYAL COLLEGE OF SURGEONS IN IRELAND

A postgraduate course in surgery will be held at various hospitals in Dublin on Mondays to Fridays during the eight weeks April 14 to June 6, beginning at 12 noon each day. Attendance at the

course, the fee for which is £21, will be strictly limited to 30. Registration may be made for either half of the course, at a fee of £10 10s., on application to Prof. N. Rae, D.Sc., registrar of the College, St. Stephen's Green, Dublin.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council, held in the College House on Jan. 25, with the President, Mr. William Gilliatt, in the chair, I. B. Ewart and G. J. St. C. Fisher were admitted *in absentia* to Membership of the College.

The following candidates were elected to the Membership of the College: D. Ballantine, Margaret R. Biggs, W. S. Campbell, H. V. Corbett, J. B. Cochrane, S. J. Cohen, G. L. Daly, A. Davis, J. R. Dickinson, Bessie Dodd, Morag Dods, I. Donald, R. C. Gill, Jean L. Hallum, A. J. Hardy, R. F. Lawrence, T. H. Lawton, J. M. McBride, R. A. E. Magee, Eileen C. Miller, J. D. Murdoch, M. K. O'Driscoll, S. S. F. Pooley, L. J. Quinn, Kathleen M. F. Worrall, J. L. Wright.

Medico-Legal

AN OVERDOSE OF NEPENTHE

The East Surrey coroner, Dr. F. J. Baron, recently inquired* into the death at Wimbledon of a girl child of 13 months. She had been suffering from severe mastoiditis and had died in hospital on the day she was admitted. Dr. D. Haler, the pathologist examining for the coroner, said that death was due to the mastoiditis, but a suggestion was made by the relatives that it had been accelerated by nepenthe, which they alleged had been prescribed in excessive dosage by Dr. Loiza Elwell-Johnston.

Dr. Haler at first stated that he did not think the drug had accelerated the death, but later admitted that he could not exclude the possibility. The mother said that the child had sickened on Dec. 31, 1946, and that Dr. Johnston had attended and brought in Dr. J. G. Lessey as a consultant. He had prescribed "M. and B tablets," and as he was about to leave he had remarked: "You might give her a little nepenthe. It will help her to sleep." When the drug arrived the mother administered some in water in a teaspoon, but the child vomited. She also gave "half a tablet of M. and B." As the baby continued to be restless she gave it a teaspoonful of the nepenthe in water. The baby then became very drowsy and "seemed somewhat peculiar," so she telephoned to Dr. Johnston, who ordered the child to be placed in a hot bath. The infant collapsed and was later removed to hospital, where she died.

Dr. Johnston said in evidence that she had written two prescriptions. One, produced in evidence, stated the dose as a teaspoonful and was inscribed as for "Janice Shelley." The other, which she supposed she had torn up or put in her pocket, had been made out for "Query half a teaspoonful in water." She had not known the exact official dose. Dr. Lessey had said the dose was small, and she had expected the chemist would know and would check it. The prescription for "M. and B" had been inscribed "Mrs. Shelley for Baby Shelley." Dr. Haler agreed with counsel for the relatives that a teaspoonful for a child of 13 months was a gross overdose, the correct dose being two or three drops, but said that children went rapidly downhill with mastoid infection and the baby could not have been saved. Mr. R. J. Cann, who examined the body for the relatives and gave evidence at an adjourned hearing, said he would have thought the overdose of nepenthe was the cause rather than the toxic absorption from the ears. He had only examined the ears, however, and made no claim to be a pathologist. The coroner found that the overdose was at least an element in the causation of death in some degree, and the prescribing of it must be regarded as evidence of negligence but not criminal negligence. His verdict was that the child died of bilateral mastoiditis accelerated by the overdose of nepenthe.

Readers will recall that Lord Hewart, the Lord Chief Justice, said in R. *v.* Bateman (1925) that between civil and criminal negligence there is a difference both in degree and in kind; it is negligence which shows such disregard for the life and safety of others as to deserve punishment.

* *Wimbledon Borough News*, Jan. 17, 1947.

Medical Notes in Parliament

SCOTTISH HEALTH SERVICE BILL

The Standing Committee on Scottish Bills considered on March 4 Clause 32 of the National Health Service (Scotland) Bill.

Mr. J. S. REID said the Clause was merely a skeleton of the general medical services which must be filled out by regulations. He asked Mr. Westwood to tell the Committee the date on which he expected these regulations to be introduced. The doctors must see the regulations in good time if they were to have a fair chance of deciding whether to come into the scheme.

Mr. WESTWOOD said many regulations would be made under this Clause and it was right that the doctors and the House should know them at the earliest moment. He hoped to issue the regulations six months before the scheme came into operation. There would have to be discussions with the medical profession and the Government also expected the House to consider the regulations. The Clause was ordered to stand part of the Bill.

Doctors Entering the Scheme

On Clause 33 Mr. REID moved to leave out in subsection 1, which deals with applications by medical practitioners to be included in the list of practitioners undertaking to provide general medical services, the words "before the appointed day." Mr. Reid said the committee had not been told why a doctor was not allowed to come into the scheme beyond the appointed day without permission. He could see no practical reason for this restriction. On the other hand there was a good political reason. The Government would hold a pistol at the head of a doctor and would tell him "you have either to come in at once or you may risk the loss of your livelihood." That was not a fair way to address the medical profession. What possible reason could there be for saying this to a doctor in an under-doctored area? Was any area in Scotland so over-doctored that the Government wanted to eliminate some of the existing practitioners?

Mr. WESTWOOD said the Clause clearly restricted the right of doctors to apply to come into the scheme after the appointed day. If any doctor could at any time come into the scheme after the appointed day, he would have the right to secure automatic participation in the medical service wherever he decided to serve. Mr. Westwood said he understood the amendment was to enable a doctor to choose an area in which he wanted to serve. That would defeat the Government's object of controlling the distribution of doctors.

Mr. REID said the amendment would only give the doctor the right to come in where he already was.

Mr. SCOLLAN raised the case of a village which received medical services from an adjoining county town. If a doctor opted to come into the scheme for his patients in the village, could he carry on his private practice in the burgh?

Mr. WESTWOOD, replying to further remarks by Mr. Reid, said that he could not promise consideration to any amendment which was intended to allow an individual to remain out of the Service as long as he liked. It would be impossible for the Secretary of State to know whether an area was under-doctored or over-doctored if certain doctors did not come into the Service on the appointed day. The difficulty envisaged by Mr. Scollan would not arise, because the Executive Council would deal with the whole of the county.

Col. ELLIOT continued the discussion of Clause 33 by moving a new subsection to ensure that regulations under the Clause should provide for requiring the Scottish Medical Practices Committee to determine the number of medical practitioners to provide an adequate service in each area or part of an area and for publication of the number of medical practitioners so determined for each area or part of an area. He said that to leave in the discretion of a committee of five as the Bill did a power to refuse one person and select another on the ground of adequacy, for which no definition existed except in the minds of that committee, was not in the public interest. There was a much more even distribution of doctors in Scotland than in England. It should therefore be possible to make some list by which the doctor desiring to move from one part to another or the medical student taking up practice would have an indication where an application was likely to be favourably regarded by the Medical Practices Committee.

Mr. WESTWOOD could not accept the amendment. It would make the scheme too rigid.

Mr. REID observed that if Mr. Westwood said the adequacy of the doctors in an area could not be determined by counting their heads then the Bill was wrongly drafted.

Mr. BUCHANAN said he did not wish to be bound by a list of doctors in areas for five years. He instanced Fife. Mining there must be considerably extended in the next few years with a population of many thousands more and the number of doctors must be increased accordingly. It was no use publishing a document unless it could convey something to the public, but he promised that he and Mr. Westwood would look into the matter again. Col. Elliot withdrew his amendment.

Freedom of Movement Restricted

On the motion that the Clause stand part, Mr. REID said that, if it went through, medical men would be practically the only persons in the country whose freedom of movement was restricted. Where was the overwhelming necessity to act toward doctors in a way which Parliament had given up with regard to everybody else? On the English Bill it had been contended that the discrepancy between the number of doctors in different areas was such that the interests of the public could be safeguarded only by restricting the movement of doctors. The Opposition had not accepted that in England, but there was an infinitely stronger case for it there than in Scotland. In England the House had found a number of cases where there were more than 3,000 per general practitioner. That was not found in Scotland. There were only thirty-odd areas in the Scottish list which seemed under-doctored. Greenock was the only one where the number of persons per doctor was over 3,000. In that town there were twenty-three general practitioners, and another half-dozen would bring Greenock well up to average. Was Parliament to impose this restriction on the whole of the medical profession to attract half a dozen doctors into Greenock? The thing could be done by differential salaries. The county of Angus was not too well doctored, but probably because a number of doctors in Dundee practised outside the city boundaries. Half a dozen more practitioners in that county would get it nearly up to the average. In West Lothian there were about twenty-seven practitioners, and the average figure for a practice was about 3,000. Very probably another ten doctors were required there, but was that a reason for setting up an enormous administrative machine? Ayrshire, Lanarkshire, Glasgow, Renfrew were all round about the average of 2,500 per practitioner and required some more practitioners, but could not be called grossly under-doctored. Under the Clause conundrums would crop up continually.

Position of Assistants

Mr. WILLIS asked for a statement on the position of the paid medical assistant under the Clause. Would he be free to make application to be included in the list of medical practitioners?

Sir WILLIAM DARLING said that if there was an undesirable area which could not acquire doctors in the ordinary way, a press gang, the Scottish Medical Practices Committee, would get hold of eight or ten unwilling doctors, male or female, black or white, and drag this herd of conscripts into an area where they did not want to go. What would be the effect upon the sick and ill in that particular area?

Mr. WESTWOOD said the paid assistant would have no title to be included in any particular list but would be free to set up practice on his own in any particular area. He could ask to be put on the list in the area in which he was an assistant, but if it was already fully doctored he could not set up in that area. If he remained an assistant, his participation in the Service would be covered by the regulations which were to be made.

Mr. RANKIN asked whether an assistant who, before the passing of the Act, was under covenant with his doctor not to enter into professional service in the area in which he acted as an assistant would be freed from that covenant by the Act.

Mr. WESTWOOD said full details would be worked out before the regulations were issued and there would be consultation with all the interests affected. If the Bill abolished the sale of practices, machinery had to be found for determining how vacancies could be filled, and Clause 33 provided that machinery. It was true that the variations in the "amount of personnel" in Scotland were not so great as in England. The highest ratio of general practitioners per head of the population, just over 1,000 per doctor, was found in Argyllshire and was due to the scattered nature of the countryside. The only area before the war in which it was suggested that there was a substantial degree of over-doctoring was Edinburgh, where the 312 general practitioners represented one for every 1,500 of the population. The idea in the Clause was contained in the White Paper issued by the Coalition Government in 1944. This had stated that an unrestricted right to any doctor to enter into new practice and there to claim public remuneration would make it impossible to fulfil the new undertaking to ensure a service for all.

The question that the Clause stand part of the Bill was then put and carried by 26 to 9.

Sale of Doctors' Premises

Mr. REID moved to leave out subsection 3 of Clause 34. This subsection deals with the sale or letting by a medical practitioner or his personal representatives to another medical practitioner of premises previously used by the first practitioner for the purpose of his practice and for a similar use by the second practitioner where the consideration for the transfer is substantially in excess of that which would be expected if the premises had not previously been used for medical practice. Mr. Reid said Clause 34 raised extremely technical points. He suggested that in the subsection the word "knowingly" had been put in the wrong place and did not read as it should that the vendor "knowingly accepts" a price above what was reasonable. Therefore, an offence could be committed by a person who in good faith sold his house to a new doctor at a price which was later determined to be substantially in excess of what might reasonably be expected. The determination of a reasonable price would not be made by the seller or by the purchaser, or by any individual the seller could consult, but by some judicial authority six months or a year later. Land valuers often differed in their estimate of prices, and a man's freedom would be imperilled because six months earlier a land valuer had said that a certain price was reasonable. How did the Government propose to draw an indictment in such a case? Was it prepared to put into the indictment the price which might reasonably have been expected? If not, a fair notice would not be given to the accused of the case against him. The last part of the subsection said that where there had been a composite transaction a court was to sort that out. Did that mean the judge or the jury?

When the Committee resumed on March 5 Mr. Reid concluded his speech and the Lord Advocate (Mr. G. R. THOMSON) replied.

The Lord Advocate said the general idea of Clause 34 was to prohibit the sale of goodwill by any medical practitioner who fell in with the scheme. In subsection 3 an attempt was made to prevent a black market in the sale of goodwill. One of the most obvious ways in which the sale of goodwill could be got round was by giving an inflated price for medical premises. The substantial danger arose from the sale of premises that had been used by the doctor, and it was essential to have a subsection of this kind in the Bill. The subsection said that if a medical practitioner was going to dispose of his premises for the purpose of a practice—this meant he had to know to whom he was selling and to know the purpose of the sale—and it turned out that the price was substantially in excess of what might have been expected for the premises, then that was a sale of goodwill. He saw no difficulty in putting this into an indictment. If the vendor knew the sale was to a doctor to enable the other practitioner to use the premises for the purpose of a practice, then the vendor was bound to be on his guard and after that the question of price was entirely a matter of evidence. It would be intolerable if the Crown had to prove that a seller knew the price was substantially in excess of what the premises were reasonably worth, or if a man could go to his solicitor, instruct him to carry out the sale, and then say, when challenged, "I never knew what the position was. I left it in the hands of my solicitor." If the vendor was apprehended he could not complain, because there were ample safeguards in the Clause. The vendor could go to the appropriate authority and get a certificate that the thing was in order. The last sentence of the subsection which provided for an apportionment by the court of the consideration paid was necessary. If premises and a motor-car were sold the court would be able to say that a fair price for the car would be £500. He saw no difficulty in working this out so far as the court was concerned. The judge might say there was not sufficient evidence, but on the question of guilt the final decision must be with the jury.

Mr. SPENCE asked who was to lay the information of an alleged fraud. Was that to be done by an informer, or by the Executive Council in the area, or by a new army of "snoopers"?

The LORD ADVOCATE said anyone to whom knowledge of an offence came was entitled to go to the Procurator-Fiscal and tell him about it. No special machinery was intended.

Mr. MCKINLAY asked what precluded the employment of the ordinary valuation machinery in the transfer of property.

The LORD ADVOCATE said Mr. McKinlay's idea was that it would be sufficient to constitute an offence if the sum paid was substantially in excess of the valuation by the district valuer. The Lord Advocate saw the force of that, but thought it better

to leave the matter to a jury. The district valuer could be a Crown witness. The mere submission of a figure to the registrar might not reveal the whole facts. There were all kinds of methods of getting information, and the whole thing was left to the ordinary law. What the Government had to get at was the case of a man who set out to sell his premises at a price which was substantially in excess of what those premises were worth in the open market and did so with the idea of getting money for the goodwill. That would be contrary to the law, and it would not be desirable to insert the words "known by him to be" in front of the word "substantial." That would put a premium on the ignorance of a man who deliberately kept away and left it to somebody else to know about the figure. In drawing an indictment his inclination would be not to put in the figure.

Mr. WESTWOOD hoped the Committee would come to a decision. The purpose of the Clause was to prohibit the sale of practices, and the Government was not retreating from that. He had not the slightest intention of allowing any subterfuge to be used. The Opposition were more interested in the price to be got for the property of a doctor who was going out of business than in looking after the doctor who was to come into the business. Mr. Westwood did not wish the incoming doctor to be overburdened with debt. In the past because of the sale of practices many doctors had been more worried about the loans by which they purchased their practices than concerned with their work. Mr. Westwood moved that the question be put. This was carried by 25 to 15 and Mr. Reid's amendment was defeated by 27 to 15.

"Irrespective of Goodwill"

Mr. WESTWOOD then moved to vary subsection 3 in respect of the definition of an excessive consideration for the sale, letting, or other disposition. In place of the reference in the subsection to a price which could reasonably have been expected if the premises had not been previously used for the purposes of a medical practice, he moved to insert a reference to the price which might reasonably have been expected "to be paid by a medical practitioner for the premises as such irrespective of goodwill." He said the amendment would make it more clear that in any transaction between one doctor and another it would be quite legitimate for the price to cover adaptations in the premises which would be of no value to a purchaser other than a doctor. Any adaptations to the inside of a house were to be allowed to be paid for.

The amendment was agreed to, but an amendment by Col. Elliot to omit the provision authorizing the court to apportion the consideration was defeated by 26 to 15.

In subsection 5, dealing with services performed as an assistant to another medical practitioner for a remuneration substantially less than those services might reasonably have been expected to be worth and followed by a succession to the practice, Mr. REID moved to amend the proviso that an offence should not be deemed to have been committed if it were shown that the remuneration of the assistant was not fixed in contemplation of his succeeding to the practice. Mr. Reid moved to make this "fixed by the second practitioner." He said he really did not understand what the Clause meant. He wanted to know what was the position if one practitioner had in mind a succession to the practice and the other had not. There might be a case of a new man who deliberately accepted too small a remuneration without there being any intention on the part of the older man of letting the new man buy the goodwill in this roundabout way. Medical men on the Committee would agree that that was a possible situation. On the other hand an older man might deliberately get a new man to come into the practice too cheaply, intending later to offer it to him, whereas the new man did not realize he was being made use of in this way.

Col. ELLIOT suggested that an assistant might take a post at a small remuneration in a district where there was a rapid increase in the practice. It could then be said that this young man succeeded to the practice in consideration of a totally inadequate remuneration. The older practitioner might have thought that this development was not coming so quickly.

The LORD ADVOCATE said that under the subsection regard must be had to the situation at the time when the bargain was made. If the parties could show that the remuneration was fixed on its merits and not in respect to any question of goodwill there was no offence.

Mr. HASTINGS said it was true that the subsection contained a serious danger of the professional man coming into collision with the courts, but the professional man still had the right to plead that he did not understand, and Mr. Hastings thought he would be in a good position. The proposed amendment was rejected by 28 to 12.

In subsection 6, which ends with a proviso that it shall not apply to anything done in relation to the acquisition of premises for the purposes of a medical practice, Mr. REID moved to insert after "premises" the words "or other property." He said the proviso guarded against the possibility that the subsection as at present drafted would make it an offence for the incoming man to buy the house. But the new man might buy from the old practitioner other things than a house. He might buy surgery equipment of different types. Under the subsection, if the incoming man gave a price for any of these movable articles and thereafter succeeded to the premises, then that payment would land him in jail because the transaction was deemed to be a sale of the goodwill.

The LORD ADVOCATE replied that the point made by Mr. Reid was met in the closing lines of subsection 6 (b): "unless it is shown that no part of the consideration was given in respect of the said goodwill or part thereof." After further discussion Mr. Reid's amendment was rejected by 25 to 12 and the Committee adjourned.

Sale of Medical Practices

When the Committee resumed on March 6 Mr. J. S. C. REID moved to amend Clause 34. In subsection 9 he asked the Committee to delete "proposed" from the provision that any medical practitioner or a personal representative of a practitioner might apply to the Scottish Medical Practices Committee for their opinion whether a proposed transaction involved the sale of the goodwill or part of the goodwill which it was unlawful to sell under the section. Mr. Reid said that this only allowed proposed transactions to be put before the Committee for their approval or otherwise. The purpose of his amendment was to give a certificate that the bargain was all right and that those who had entered into it would not be harassed by the complicated provisions in the earlier part of the Clause. If Mr. Buchanan would undertake to put in during the Report Stage some time limit within which the Medical Practices Committee would give its decision, that would meet the case nearly as well as acceptance of his amendment. In the absence of such a concession he did not think it safe to assume that these decisions would be given promptly.

Mr. BUCHANAN said he did not think that acceptance of a proposal to insist on decisions within three weeks would be an improvement. Time limits to answers from committees were not always good. He liked Mr. Reid's other proposal even less. It would allow the doctor to carry out a transaction and leave the Committee to decide afterwards. He agreed with Mr. Reid that practically 99% of the cases would be innocent.

Mr. REID withdrew his amendment and moved to insert that the Medical Practices Committee should grant the certificate requested unless they found reason to believe that there was something wrong in the transaction. His form of words was intended to replace the words in the Bill "if they are satisfied that the transaction or series of transactions does not involve the giving of valuable consideration." Mr. Reid pointed out that under the words of the Clause the Committee would give a certificate only if satisfied that the negative had been proved. He said it was surely sufficient to direct the Committee to give a certificate unless they had reason to believe that something was wrong.

The LORD ADVOCATE said he could not accept this amendment.

Mr. SCOLLAN asked whether the Lord Advocate and Mr. Buchanan were prepared to reconsider the matter. He suggested that the Committee could at least insert "unless they find reason to believe." He said that immediately the National Health Service came into operation there was bound to be a reshuffle of practices. Older men would say that they would retire because they could not be bothered any more about it.

Mr. BUCHANAN said he did not propose to reconsider the matter. The closure was carried by 21 to 12 and the amendment was defeated by 22 to 12.

Mr. REID moved to amend the passage in subsection 10 making a proviso that if it appeared to the court that the applicant had failed to disclose all the material circumstances the court might disregard the certificate. He proposed to insert the word "wilfully." He said that, as the Clause stood, if the man omitted from his letter to the Committee something which he thought irrelevant, then there was a risk that an innocent person might be prosecuted ten years afterwards even if there was no element of fraud.

Mr. BUCHANAN said that the facts would have to be reported to the Procurator-Fiscal. The Medical Practices Committee would not report cases to the Scottish Office and cases would not come to the Lord Advocate directly. The proposed amendment was defeated by 22 to 16.

Black Marketing in Goodwill

On the motion that Clause 34 as amended stand part of the Bill Col. ELLIOT said the complexities of the discussion on this Clause showed the difficulty into which the Government had put itself. It had got itself into almost inextricable legal and administrative tangles. Four pages of type were required to set down the considerations which should be brought in to enforce this decision, and these pages might not comprise all the considerations which would be brought in. The whole Committee agreed that it was creating a new kind of offence hitherto unknown in Scottish medical practice—what the Lord Advocate had described as black marketing in goodwill. That phrase showed to what depths Parliament was sinking in this particular Bill.

Mr. SCOLLAN said there were parts of the Clause which the Government might well reconsider before bringing the Bill back to the House of Commons. He had a son who was a doctor. Nothing in the Bill would prevent him buying a house, paying a black market price for it, and handing it over to his son.

Mr. BUCHANAN said objections came from some members on his side who had a fundamental objection to the sale of practices. He asked the Committee to remember that the medical profession were getting £66 million of public money and the Government had a right to see that the profession did not get that money twice over. He admitted that the practices against which the Clause was aimed were the most difficult things in the world to stop.

Major LLOYD said the Clause was based on an unsound principle which deprived British people of the normal right of freedom in property. If a doctor had bought a house why should he not sell it if he so desired?

The Clause was approved as amended by 24 to 16. Discussion then opened on Clause 35 just before the Committee adjourned.

EPIDEMIOLOGICAL NOTES

Smallpox at Grimsby and Stepney

In the outbreak of smallpox at Grimsby which we recorded last week (p. 320) there had been 15 cases with 6 deaths, all in the direct line of contact, by March 10. The situation at Grimsby is now believed to be fairly satisfactory.

One case of smallpox was diagnosed in Stepney on March 9. The patient was a member of the staff of a seamen's hospital. He fell sick on Monday, March 3, and was admitted to the Mile End Hospital during the week. A diagnosis of smallpox was made on Sunday, March 9, and he was transferred to the hospital at Clandon, Surrey.

Acute Gastro-enteritis in Ammanford

There were recently about 300 cases of acute gastro-enteritis in the Ammanford area of Carmarthenshire. The first cases appeared on Nov. 15, 1946, and varied in severity. Some had mild diarrhoea, others severe vomiting and diarrhoea with blood in the stools. Profuse growths of organisms of the Salmonella group were obtained from several specimens of faeces. On further investigation it was found that in nearly every case prepared meats, especially pressed beef and sausages, had been eaten.

The staff at the local butcher's shop consisted of the butcher, his wife, his son, and two female assistants. One of the assistants was taken ill with gastro-enteritis two days before the outbreak began and was away from the shop from the first day of her illness. Specimens of faeces were collected from the rest of the staff. Three were negative but that of the remaining female assistant produced a growth of Salmonella organisms. She was suspended from work immediately, as a probable carrier, and remained off work until three consecutive negative specimens of faeces had been obtained.

Specimens of gelatin used in the preparation of the meats were taken, but were all negative. It seemed that the cause must be a foodstuff which had been eaten by both the female assistants, producing symptoms of gastro-enteritis in one but not in the other, the latter becoming a carrier. After much questioning it was found that three days before the start of the outbreak both assistants had eaten some bananas.

An interesting point was that the father of the suspected carrier was taken ill with gastro-enteritis although he had not eaten any of the meats. His food, however, had been prepared by his daughter. The outbreak cleared up quickly once the suspected carrier was suspended from work. There were no fatal cases.

Discussion of Tables

In *England and Wales* an increase was recorded in the notifications of whooping-cough in both weeks, 122 and 263. A fall in both weeks was reported for measles and acute pneumonia, the notifications being 1,493 and 444, respectively, fewer than in the previous fortnight.

Only small variations in the trend of scarlet fever occurred throughout the country. The incidence of pneumonia declined in all areas. The only notable changes in the local trends of whooping-cough during the fortnight were increases in Yorkshire West Riding 100 and Middlesex 47.

Changes in the incidence of measles have been dominated by the experience of Lancashire with a decrease of 1,185 in the notifications during the fortnight. Other large decreases in the incidence of measles were in Yorkshire North Riding 204, Durham 203, Kent 150, Devonshire 140, and Nottinghamshire 104. The largest increases were Yorkshire West Riding 262, Surrey 125, and Berkshire 100.

The returns for dysentery during the week ending Feb. 15 were the lowest for six years. During the week ending Feb. 22 dysentery reappeared after an interval of a fortnight in Hertfordshire, St. Albans R.D., and 29 persons were affected.

During the first eight weeks of this year 81,080 births have been registered in the great towns, which is 139% of the total registered in the same period last year. The stillbirth rate has fallen to 27 per 1,000 of the total births during this year compared with 31 per 1,000 during the same period of 1946.

In *Scotland* the chief feature of the returns for the past fortnight was an increase in dysentery of 32 in the week ending Feb. 22. This rise was due to an outbreak in Banff County involving 38 persons.

In *Eire* a fall in the incidence of measles and a rise in the notifications of whooping-cough were the only changes in trend during the fortnight. Cases of measles fell from 66 to 33, but cases of whooping-cough rose from 66 to 108, of which 100 were recorded in Dublin C.B.

In *Northern Ireland* the epidemic of measles in Belfast C.B. continued to decline, and 287 cases were notified during the week ending Feb. 22 as compared with 739 a fortnight earlier.

Tuberculosis Mortality

The death rate from respiratory tuberculosis rose during the first year of the war from 522 per million in 1939 to 588 and 602 in 1940 and 1941. In 1942 the death rate fell to 542. The mortality for the first half of 1946 compared with pre-war experience is shown in the following table.

Death Rates from Respiratory Tuberculosis per 1,000,000

Ages	Males			Females		
	Average of 1931–35	1939	1st half of 1946	Average of 1931–35	1939	1st half of 1946
0+	85	54	71	74	38	64
5–	42	15	31	43	20	26
10–	64	31	26	143	86	78
15–	489	368	236	842	601	307
20–	967	682	517	1,144	955	859
25–	966	723	658	914	707	658
35–	1,135	859	739	644	469	410
45–	1,369	1,158	1,101	474	352	270
55–	1,175	1,171	1,227	392	300	265
65+	610	559	712	265	209	177
Crude death rate	768	638	613	543	410	355

The death rate for both sexes at ages under 10 still remains above the immediate pre-war level. The only other age group with an excess is that of males aged 55 and over. The only age group with a rate higher than in 1931–5 is that of males aged 65 and over.

The death rate for tuberculous meningitis fell in 1946, but at ages 5–14 the mortality is still in excess of the 1939 level.

Tuberculosis of Meninges and Nervous System
(*Death rate per* 1,000,000)

Ages	Boys				Girls			
	1939	January–June			1939	January–June		
		1944	1945	1946		1944	1945	1946
0+ ..	284	313	310	269	252	257	262	210
5– ..	97	118	130	110	77	105	120	104
14– ..	52	70	68	89	66	86	81	81

Week Ending March 1

The notifications of infectious diseases during the week in England and Wales included: scarlet fever 1,167, whooping-cough 2,290, diphtheria 186, measles 13,337, acute pneumonia 981, cerebrospinal fever 74, dysentery 92, acute poliomyelitis 8, smallpox 5, typhoid 5. Deaths from influenza in the 126 great towns numbered 121.

INFECTIOUS DISEASES AND VITAL STATISTICS

No. 7

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Feb. 15.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. *Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for:* (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland. A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1947					1946 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	78	2	22	4	—	73	5	26	—	3
Deaths		1	—				2	2		
Diphtheria	211	23	58	23	6	489	23	115	58	17
Deaths	3	—	1		—		—	2	—	1
Dysentery	41	6	19	—	—	255	14	41	—	1
Deaths					—				—	—
Encephalitis lethargica, acute	5	—	3	1	—	2	—	—	—	—
Deaths		—					—			
Erysipelas			47	6	1			38	8	3
Deaths		1					—			
Infective enteritis or diarrhoea under 2 years	80	4	26	26	—	50	6	10	23 9	2
Deaths										
Measles*	16,749	597	303	62	489	1,489	353	192	58	4
Deaths	15	2	1		2	2	—	—	—	—
Ophthalmia neonatorum	59	2	17	—	1	74	5	16	1	—
Deaths										
Paratyphoid fever	1	1	—	—	—	—	—	—	—	—
Deaths	—	—	—		—	—	—	—	—	—
Pneumonia, influenzal	1,404	80	27	25	7	1,387	79	68	37	6
Deaths (from influenza)†	163	19	6		8	220	34	22	9	10
Pneumonia, primary			296	46				424	28	
Deaths		106			23		72		18	22
Polio-encephalitis, acute	—	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	8	—	—	5	—	9	—	—	—	—
Deaths		—					—			
Puerperal fever		2	6		—		2	18		—
Deaths										
Puerperal pyrexia‡	160	9	13	1	—	147	10	18	—	1
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,051	67	240	9	41	1,303	90	204	25	40
Deaths	1	—	—		—	1	—	—	—	2
Smallpox	—	—	—	—	—	4	2	—	—	—
Deaths					—				—	—
Typhoid fever	5	—	—	5	1	5	1	2	9	—
Deaths	1	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough*	1,964	180	381	81	32	1,329	112	91	26	5
Deaths	14	1	4		3	8	—	1	2	—
Deaths (0–1 year)	579	70	113		24	408	58	82	32	19
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	8,091	1359	880		237	5,961	940	744	247	200
Annual death rate (per 1,000 persons living)			18·3					16·4	15·8	
Live births	10,195	1620	1233		278	7,579	1095	949	462	267
Annual rate per 1,000 persons living			24·8					19·1	29·6	
Stillbirths	288	41	41			251	39	37		
Rate per 1,000 total births (including stillborn)			32					38		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.
† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
‡ Includes puerperal fever for England and Wales and Eire.
It is still not possible to publish the return of births and deaths for Eire for the weeks ended Oct. 26, Nov. 2, 9, 16, 23, 30, Dec. 7, 14, 21, 28, 1946; Jan. 4, 11, 18, 25, Feb. 1, 8, and 15, 1947.

No. 8

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Feb. 22.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. *Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for:* (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland. A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1947					1946 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	90	11	21	3	4	71	8	24	—	—
Deaths		1	—				2	—		
Diphtheria	217	16	51	19	6	510	33	136	51	19
Deaths	2	1	1		—	12	1	2	2	—
Dysentery	92	10	53	—	—	406	29	62	—	2
Deaths					—				—	—
Encephalitis lethargica, acute	3	—	—	—	—	2	—	—	—	—
Deaths		—								
Erysipelas			59	7	4			41	12	4
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years	69	5	18	21	2	52	7	10	40 9	4
Deaths										
Measles*	15,765	644	300	33	288	1,587	389	393	69	1
Deaths	13	—	2		3	1	—	2	—	1
Ophthalmia neonatorum	59	4	12	—	—	64	4	15	1	1
Deaths										
Paratyphoid fever	—	—	1 (B)	—	—	4	1	—	—	—
Deaths	—	—	—		—	—	—	—	—	—
Pneumonia, influenzal	1,139	84	20	38	10	1,125	57	66	25	15
Deaths (from influenza)†	135	21	7		6	141	17	13	9	4
Pneumonia, primary			282	25				333	87	
Deaths		115			23		34		13	14
Polio-encephalitis, acute	1	—				1	1			
Deaths							—			
Poliomyelitis, acute	14	—	1	5	—	4	1	—	1	—
Deaths		—					—			
Puerperal fever		3	12		1		5	24		—
Deaths		—								
Puerperal pyrexia‡	142	11	13	—	—	171	12	17	—	1
Deaths		—					—			
Relapsing fever	1	—			—	—	—			—
Deaths										
Scarlet fever	1,081	70	218	20	33	1,307	116	162	18	33
Deaths	1	—	—		—	2	—	—	—	—
Smallpox	2	—	—	—	—	1	—	—	—	—
Deaths					—				—	—
Typhoid fever	3	—	—	3	—	7	—	1	8	—
Deaths	—	—	—		—	—	—	—	1	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough*	2,227	212	387	108	32	1,632	133	98	43	6
Deaths	9	2	6		2	6	1	—	1	—
Deaths (0–1 year)	572	67	103		27	414	57	64	38	17
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	7,896	1313	931		224	5,195	820	687	259	167
Annual death rate (per 1,000 persons living)			19·4					15·1	16·6	
Live births	10,194	1596	1231		297	7,263	1035	910	416	251
Annual rate per 1,000 persons living			24·8					18·3	26·7	
Stillbirths	260	33	40			256	37	39		
Rate per 1,000 total births (including stillborn)			31					41		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.
† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
‡ Includes puerperal fever for England and Wales and Eire.
It is still not possible to publish the returns of births and deaths for Eire for the weeks ended Oct. 26, Nov. 2, 9, 16, 23, 30, Dec. 7, 14, 21, 28, 1946; Jan. 4, 11, 18, 25, Feb. 1, 8, 15, and 22, 1947.

Medical News

We announce with regret the death of Prof. Bryan Austin McSwiney, F.R.S., Dean of St. Thomas's Hospital and Professor of Physiology in the Sherrington School of Physiology.

A conference arranged by the Electron Microscope Group of the Institute of Physics and the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C.1, on Thursday and Friday, March 20 and 21, at 7.30 p.m. each day, when the following public lectures will be delivered: March 20, Mr. J. Smiles, "Survey of the Inter-relationship of Microscopical Techniques"; March 21, Prof. W. T. Astbury, F.R.S., "The Electron Microscope."

A meeting of the London Jewish Hospital Medical Society will be held at Woburn House, Upper Woburn Place, London, W.C., on Thursday, March 20, at 8.30 p.m., when an address will be delivered by Miss Muriel Landau, F.R.C.S., on "Recent Advances in Gynaecology."

The following radiological meetings will be held in London this month: Friday, March 21, 2.30 p.m., at Royal College of Surgeons of England (Lincoln's Inn Fields, W.C.), Diagnostic Section of Faculty of Radiologists: Dr. S. Cochrane Shanks, "Hiatus Hernia." Friday, March 21, 8 p.m., Section of Radiology of Royal Society of Medicine, 1, Wimpole Street, W.: Dr. J. F. Brailsford, "Some Experiences with Bone Tumours." Friday and Saturday, March 21 and 22, meetings of British Institute of Radiology at French Institute, Queensbury Place, S.W.: March 21, 5 p.m., Dr. F. Baclesse, "Cancer of the Larynx"; March 22, 10.15 a.m., presidential address by Prof. D. W. Smithers; 11.20 a.m., papers on treatment of carcinoma of the cervix; 2 p.m., demonstrations at Royal Cancer Hospital.

The seventh annual general meeting of the Colour Group of the Physical Society will be held at the Royal Photographic Society's rooms (16, Prince's Gate, South Kensington, S.W.) on Wednesday, March 26, at 3.15 p.m. A science meeting of the Group will follow at 3.30 p.m., when a paper by Mr. M. E. Clarkson and Drs. O. L. Davies and T. Vickerstaff on "A Statistical Investigation of Some Aspects of Colour Harmony" will be read.

The seventh Clarke Hall Lecture on "Mental Health and the Offender" will be delivered by Dr. J. R. Rees in the New Hall of Lincoln's Inn, W.C., on Wednesday, March 26, at 4.30 p.m.

A meeting of the Middlesex County Medical Society will be held at Glaxo Laboratories, Greenford Road, Greenford, on Thursday, March 27, at 2.30 p.m., when Dr. H. M. Walker will speak on "Laboratory Investigation of Drugs" and Dr. E. Lester Smith on "Biological Substances (Liver Extract and Folic Acid)."

A meeting of the Scottish Group of the Association of Industrial Medical Officers will be held at the Western Infirmary, Glasgow, on Friday, March 28, at 2.30 p.m., when Mr. Roland Barnes will speak on "Back Injuries in Industry." A clinical demonstration will follow.

The annual clinical meeting of Guy's Hospital Dental School will be held in the dental department of the hospital on Saturday, March 29. Morning and afternoon sessions will be held and demonstrations of modern dental procedures given by members of the staff; cases of clinical interest will be shown.

The Ministry of Fuel and Power will exhibit structural insulation, domestic heat services, and district heating, at the Scottish Fuel Efficiency Exhibition, to be held at the Kelvin Hall, Glasgow, from March 19 to April 5.

The International Committee of the Red Cross is holding a conference at Geneva in March to study the question of reviving the Geneva and The Hague Conventions. The Comité International de Médecine et de Pharmacie Militaires has prepared a report for their consideration.

A reunion dinner for ex-C.M.F.-M.E.F. physicians, including neurologists, dermatologists, psychiatrists, and radiologists, will be held at Grosvenor House, Park Lane, London, W.1, on Saturday, April 26, at 7 p.m. for 7.30 p.m. The cost of the dinner will be 25s. exclusive of wines. Those interested are asked to communicate before March 31 with either Dr. W. MacLeod, 3, Drumsheugh Gardens, Edinburgh, or Dr. A. Willcox, 66, Harley Street, London, W.1. As numbers have to be limited owing to catering difficulties, early applications are invited.

The Lord President of the Council has appointed the following to serve on the Advisory Council on Scientific Policy: Sir Henry Tizard, chairman, Sir Edward Appleton, Sir Alan Barlow, Sir Howard Florey, Sir John Fryer, Sir Claude Gibb, Sir Edward Mellanby, Sir Edward Salisbury, Sir Ewart Smith, Sir Reginald Stradling, Prof. A. R. Todd, Dr. A. E. Trueman, Prof. S. Zuckerman.

The Medical Society of London held its Anniversary Dinner on March 6, Sir Philip Manson-Bahr, the President, being in the chair. The toast of the Society was proposed by Lord Oaksey, who as Lord Justice Lawrence was the British President of the International Tribunal at Nuremberg. Lord Oaksey gave an interesting talk on the implications of the Nuremberg trial, pointing out that the existence of international law carried with it a limitation of national sovereignty. The health of the visitors was proposed by Mr. A. Dickson Wright and responded to by Lord Moran. The former observed that John Coakley Lettsom was one of the last pair of seven sets of twins, and with his brother the only ones to survive. Lettsom's father was a Quaker planter in the West Indies. John Coakley was born in 1744, was sent to England in 1750, founded the Medical Society of London in 1773, and died in 1815.

Three hundred doctors and medical students at the Johns Hopkins Hospital, Baltimore, watched on television screens as surgeons performed an operation. The experiment is regarded as a new and effective method of surgical education. Two television cameras were used, one mounted over the operating table itself and the other, equipped with a telephoto lens, in the gallery of the operating theatre. The surgeon performing the operation gave a running commentary through a microphone mounted above the table. Ten receivers were placed in other parts of the hospital and the students could watch the operation closely "without crowding round the patient." Dr. Edwin Crosby, the director of the hospital, commented: "Television has brought the operative field within the critical sight of large numbers of doctors and students and will permit them to witness many operations."

We have received from the Melbourne Permanent Postgraduate Committee a copy of the syllabus of medical postgraduate facilities for 1947, which include continuous and intensive refresher courses, late afternoon courses, a course for dermatologists, country courses, courses for higher degrees and diplomas and by overseas lecturers, film afternoons, supernumerary residentships, and individual postgraduate study. The programme opened in February, and each month until November a number of the above-mentioned courses will be held. Full particulars may be obtained from the director of the committee, Dr. F. Kingsley Norris, C.B.E., D.S.O., c/o Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1, Australia.

Mr. E. D. Macgregor, C.B., Director of Establishments in the Ministry of Health since May, 1939, is retiring from the public service on March 31. Mr. E. M. T. Firth, Assistant Secretary in the Establishments Division, has been promoted to be an Under-Secretary, and the Minister, with the approval of the Prime Minister, has appointed him to succeed Mr. Macgregor as Director. Mr. S. F. Wilkinson has been promoted to be an Under-Secretary in the Ministry.

Dr. Arthur Massey, C.B.E., medical officer of health to the City of Coventry since 1930, has been appointed Chief Medical Officer to the Ministry of National Insurance at a salary of £2,250 per annum. Dr. Massey, who will take up his appointment shortly, is to advise the Minister on medical matters in connexion with the administration of the National Insurance Act and the Industrial Injuries Act.

We have received recently the *Handbook* for 1946 of the National Children Adoption Association. It includes a report of the Executive Committee from April, 1944, to March, 1946, and can be obtained for 1s. on application to the Association at 71, Knightsbridge, London, S.W.1.

A. O. Davy, F.R.A.C.S., L. F. Dods, M.D., F.R.A.C.P., C. C. Finlay, M.B., Ch.M., Prof. B. T. Mayes, F.R.A.C.S., F.R.C.O.G., and Group Capt. H. R. G. Poate, F.R.C.S., F.R.A.C.S., R.A.A.F., have been appointed M.V.O. (Fourth Class).

Dr. Donald Paterson has recently been made a Corresponding Member of the Société de Pédiatrie of France and an Honorary Fellow of the American Academy of Pediatrics.

Prof. John A. Ryle received the honorary Doctorate of Science from McGill University, Montreal, at Oxford, on March 11.

Mr. R. M. De Mowbray, F.R.C.S., of Lymington, Hants, who died on Sept. 24, 1945, left £55,894. Dr. J. A. Pringle, of Canterbury, who died on Feb. 12, 1946, left £36,631. Lieut.-Col. A. Whitmore, M.D., I.M.S. (ret.), of Medingley, Cambs, who died on June 26, 1946, left £31,376. Dr. A. F. Voelcker, F.R.C.P., of Marhamchurch, Cornwall, who died on June 9, 1946, aged 84 years, left £16,559. Col. Hugh Murray Morton, C.M., C.B.E., D.S.O., late R.A.M.C., of Berwick-on-Tweed, who died on Aug. 7, 1946, aged 73, left £23,036. Dr. William Evans Thomas, J.P., of Rhondda, Glamorganshire, who died on Jan. 20, 1946, aged 82, left £38,191. Dr. Benjamin Rigby Johnston, of Westmorland, who died on March 17, 1946, aged 84, left £15,919. Dr. Herbert Harland Raw, of Whitby, who died on Aug. 5, 1946, aged 68, left £9,802. Dr. Henry Charles Meacock, who died on Feb. 28, 1946, left £83,921. Dame Elizabeth Stanton, M.R.C.S., L.R.C.P., who died on Feb. 1, 1946, left £37,972 gross, with net personalty £37,819.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Penicillin in General Practice

Q.—*I should like advice on the uses of penicillin in general practice. An indication of the types likely to be most useful to the G.P., a few notes on storage, and the recommended dosage for the more ordinary but none the less distressing conditions would be appreciated.*

A.—Penicillin powder as now supplied in sealed ampoules is so much more stable than earlier products that it can be stored at ordinary room temperature for any reasonable period. Solutions are better kept in a refrigerator unless used within a few days, as are creams. The temperature in the open part of a domestic refrigerator—about 40° F. or 4.4° C.—is satisfactory.

Some minor conditions can be treated by the local application of penicillin: impetigo by means of a cream, and throat infections by oral tablets. Any infection not so superficially situated can usually be treated only parenterally—that is, by intramuscular injections. If this has to be done, the fact that the lesion is small does not mean that the dose can be small in proportion. Whether a staphylococcus is producing osteomyelitis or merely a carbuncle of moderate size, the minimum concentration of penicillin required in the blood to check its further activity is the same. It is therefore useless to give penicillin intramuscularly in doses of less than, say, 20,000 units four-hourly. If the interval between doses is longer than this the dose must be greatly increased. Hence this form of treatment is not usually worth while, except in fairly severe or potentially dangerous septic conditions. There are now several books on the therapeutic use of penicillin, one of which the questioner is advised to consult for further details.

Treatment of Chronic Diverticulitis

Q.—*What is the best treatment for chronic diverticulitis in a patient of 72 who has been suffering on and off for the last ten years? There is a history of enteric and diarrhoea in the Boer War, and dysentery followed by colitis after Gallipoli. The patient suffers frequent pain and discomfort, especially at night. Some relief is obtained from colloidal aluminium silicate given during the day and codeine gr. 1/2 (32 mg.) at night. Is it advisable to go on with this? Would a course of sulphathalidine be worth trying?*

A.—This type of case often offers great therapeutic difficulties. It is advisable to continue with a low-residue diet and mineral oil in some form, as these measures should diminish stasis and the risk of further infection. The predominance of pain at night suggests that intestinal flatulence is a factor, and to diminish this it would be advisable to restrict bread and potatoes to a minimum; some help may be given by charcoal in finely divided form. Any superadded spasm would be reduced by belladonna or atropine. Unless there is abdominal tenderness it is unlikely that very active inflammatory change is in progress around the diverticula. If this is present it would be worth trying one of the sulphonamide drugs, preferably sulphadiazine or a similar compound. Sulphathalidine would be better avoided on account of its constipating effect. There is no harm in continuing with colloidal aluminium silicate and codeine for a time.

Teeth-grinding

Q.—*What is the cause of teeth-grinding of sudden onset during sleep? What treatment is advised?*

A.—Teeth-grinding during sleep is evidence of some degree of tension in the child and is in the same category as overactivity, restlessness, nail-biting, etc., during the day, and restless or disturbed sleep at night. It may be provoked by physical discomfort associated with skin irritation, enlarged adenoids, etc., and the traditional connexion with intestinal worms may arise when they cause anal irritation. Most commonly, however, the cause and treatment are to be sought in the daily life of the child. Such factors as an over-anxious mother, intrafamilial stresses, undue restriction in the home, or pressure at school should be explored. Spasmodic teeth-grinding has been quoted (Kanner, *Child Psychiatry*) as being associated with neurological damage in juvenile paresis, and it presumably may occur as a minor epileptic phenomenon. Such organic causes are extremely rare. The aetiology in adults is similar, but the stress is much more liable to be within the personality and less susceptible to modification of the outside situation.

Bee-sting Anaphylaxis

Q.—*A bee expert of 30 years' experience, when giving practical demonstrations, makes a bee sting the back of his hand. He gets no local reactions or sensations whatever. Is he more liable to anaphylactic reaction than a beekeeper who is only occasionally stung?*

A.—There is evidence to suggest that frequently repeated stings produce a condition of immunity and that reactions are more likely to develop after occasional stings. It would seem, however, that some persons are more likely to develop reactions than others, and this might well depend on whether or not they have an allergic personal or family history.

Treatment of Dipsomania

Q.—*What is the current authoritative medical opinion on the treatment of dipsomania by ingestion of large quantities of alcoholic drink followed by injection of apomorphine? It has been recommended for a patient of 49 and I am anxious to give it a trial.*

A.—An account of the treatment described is given in this *Journal* for March 18, 1944, at page 399, together with the references. It has been regularly used by Voegtlin in San Francisco, and by Reese in Madison, Wis., and is certainly successful in willing subjects. The duration of cure differs; out of 1,042 patients treated only 40% were still cured 5 years later. The treatment can, however, be repeated at yearly intervals.

Thymol Turbidity Test

Q.—*What is the thymol turbidity test?*

A.—The thymol turbidity test is fully described by N. F. Maclagan (*Brit. J. exp. Path.*, 1944, 25, 234), who devised it. It is an empirical test, derived from an accidental observation. The addition of thymol as a preservative to a solution used in the serum colloidal gold reaction was noticed to cause a turbidity or precipitate with sera from cases of parenchymatous liver disease. For details of the technique the original paper should be consulted. Maclagan gives its results in 248 cases of liver disease (positive in 91% of cases of infective hepatitis, 100% of hepatic cirrhosis, 47% of post-arsphenamine jaundice, 52% of Weil's disease, and 7% of obstructive jaundice) and in 217 control patients of whom 21% gave positive results (cases of glandular fever, rheumatoid arthritis, heart failure, pernicious anaemia, etc.). A positive result is believed to indicate an increased serum gamma-globulin content.

Buccal Ulceration and Menstruation

Q.—*What are the aetiology and treatment of ulcers of the mouth which occur only near the time of menstruation? I have an edentulous patient aged 40, who has severe pain and signs of mild inflammation at one point on the lower jaw coinciding with a menstrual period. X-ray examination reveals no abnormality of the ramus.*

A.—Cyclical buccal ulceration occurring in relation to menstruation is a well-recognized syndrome, and there is often, but not always, a coincident ulceration of the vulva or lower vagina. The aetiology is unknown, but there are many theories put forward to account for it. It has, without much evidence, been regarded as the result of an infection by a special bacillus; others look on it as a form of herpes. The view that it is an allergic manifestation is supported by the fact that there is sometimes a strong family history of other allergic diseases. The relation to menstruation and the fact that the ulceration clears up during pregnancy (but usually recurs afterwards) have given rise to several theories with an endocrine basis.

Various vitamin deficiencies and disturbances in the alimentary tract have also been blamed. It is possible that different mechanisms operate in different cases. Treatment is unsatisfactory. Protein-sensitivity tests should be carried out and any focus of sepsis in the mouth eradicated. Large doses of vitamin C might be tried. Chorionic gonadotrophin (500 i.u. intramuscularly twice weekly) appears to help in some cases, but may have to be continued indefinitely. See also replies to questions in the *Journal* for Dec. 25, 1943 (p. 839), and June 15, 1946 (p. 940).

Green Teeth

Q.—*I have a patient aged 2 years with "green teeth." Has the Rh factor any bearing on this disease?*

A.—The presence of true green teeth is a rare condition usually following icterus gravis, and has been noted in the permanent teeth of patients who have recovered from that disease in infancy. The Rh factor is, of course, connected with this disorder. The more common appellation of green teeth is given to teeth showing the characteristic green stain of chromogenic bacteria. This is often seen on the anterior teeth in children, and can usually be removed with mild abrasives.

Generalized Pruritus

Q.—*An old woman of 75 is suffering from widespread pruritus. She was in good health, though frail, until a couple of years ago, since when she has had burning pain at different times in the perivulval and perirectal region, the left side of the chest, left iliac fossa, the face, and the forearms. The perirectal pain seems to be the worst. She has had no sugar in her urine. Any advice would be helpful.*

A.—It is important to exclude carcinoma (especially of the stomach, rectum, or bowel), anaemia, or vitamin deficiency. In the absence of these the itching is likely to be psychogenic in origin, or may be due to arteriosclerosis, especially as it affects the central nervous system, or to vitamin B deficiency. Injections of liver and phenobarbitone in 1/2-gr. (32-mg.) doses may help. Locally Grenz-ray therapy, if available, should be applied, otherwise the following should be prescribed:

℞

Acid. carbol.	ɱx (0.6 ml.)
Calamin.	gr. xl (2.6 g.)
Lanolin.	gr. xxx (2 g.)
Ol. oliv.	ʒss (15 g.)
Aq. calcis.	ad ʒj (30 g.)

Fiat cremor

Cocaine and allied preparations should never be employed.

Sweating Feet

Q.—*A boy of 11 suffers from excessive sweating of his feet. There is the usual strong smell from his socks and shoes, and the boy is very conscious of the condtion, with a dread of elaborate treatment "lest the other boys know." What can I do for him?*

A.—This is emotional sweating, and the boy should take phenobarbitone gr. 1/4 (16 mg.) each night for three, six, or twelve months as may prove necessary. He should wash the feet every night, have clean socks daily, and use the following foot powder as a daily routine before putting them on:

℞

Sod. hexametaphosph.	5%
Acid. salicyl.	2%
Zinc. oxid.	āā ad 100%
Talc	
Acid. bor.	

Fiat pulv.

Congenital Syphilis

Q.—*A woman whose husband has contracted syphilis has become pregnant by him. She herself has not contracted the disease, and her Wassermann remains negative. Is there any chance of the baby's being syphilitic?*

A.—If the wife has not contracted syphilis she cannot give birth to a syphilitic child; *Treponema pallidum* does not pass in a spermatozoon to the ovum. However, the possibility must be considered that she has contracted the disease but shows no sign of it: it would therefore be wise to keep her under careful observation with periodical blood tests right up to term.

Letters and Notes

Sodium Morrhuate Injections

Mr. HAROLD DODD (London, W.) writes: The reply (Feb. 8, p. 243) to "What is the explanation of the 'fainting feeling,' pain in the ankle, and severe headache" after the above is, I suggest, only partial. It seems to me that the essential is that sodium morrhuate is a substance of variable chemical composition. Some preparations contain an element which, when injected for the sclerosis of varicose veins, causes reactions varying from the above faint feeling to sudden death. I have reported one of the latter after 3 ml. of 5%. The journals also from time to time have told of other fatalities and collapses. Many medical men will describe experiences of the above undesirable reactions. The crux of the matter is, therefore, that sodium morrhuate should be abandoned forthwith for varicose vein sclerosis. It is dangerous quite apart from the fact that it is an indifferent sclerosing agent. I think its use is criminal. Even after injections of "ethamolin" (a somewhat similar but stable preparation) occasional unpleasant reactions have been described in the medical press. May I recommend an alternative sclerosing agent whose qualities are safety, self-sterilization, powerful sclerosing action, a but slightly painful chemical thrombo-phlebitis, and non-irritation when inadvertently injected outside veins. I have not seen an injection ulcer from it. Autoclaved gelatin ½%, glucose 25%, glycerin 30%, phenol 2% in distilled water. It is called P3G fluid. Dose 1-5 ml. It has one disadvantage: during very cold weather it requires slight warming because the gelatin tends to thicken it. I have used this daily for three months in hospital and private work with excellent results. I was reintroduced to carbolic acid as a sclerosant by Mr. Riddoch, of Birmingham, who tells me that he has injected it in another formula for years on thousands of occasions with consistent safety.

Health Service in Ancient Egypt

Dr. T. S. WILSON (London, S.W.11) writes: Diodorus Siculus (1, 82) writes the following about the health services of ancient Egypt: "In expeditions and journeys from the country all [the sick] are taken care of without giving pay privately, for the physicians receive support from the community, and they provide their services according to a written law compiled by many famous physicians of ancient times. And if after following the laws from the sacred books they cannot save the patient, they are let go free from all complaint, but if they act contrary to what was written, they await condemnation to death, since the law-maker thinks that few men would have knowledge better than the method of treatment observed for a long time and prescribed by the best specialists." The passage of several millenniums does not appear to have altered the opinions of the law-maker to any considerable extent. May one, however, assume that the Minister of Health has at least decided against the reapplication of the ancient Egyptian penal code?

Penicillin Lozenges

Dr. G. J. GRAINGER (London, S.W.4) writes: Could not penicillin be prepared in the form of gelatin-base gums or pastilles as opposed to the present-day lozenges? I suggest this for the following reasons: (1) They would take longer to dissolve, and therefore the action of penicillin in the buccal cavity would be prolonged; (2) many patients complain of the "chalky flavour of the lozenges; (3) in some patients this produces marked nausea; (4) there would be less tendency to crush and swallow a pastille; (5) a smaller dosage of penicillin would be required in the treatment of oropharyngeal affections.

Correction

In the article "The Place of Unilateral Renal Disease in Hypertension," by C. W. Hardwick and A. W. Badenoch, published in our issue of March 8, the word hyperplasia at the beginning of the last paragraph of column 1, p. 295, should be hypoplasia, and the sentence read: "In renal hypoplasia there is an immature or rudimentary kidney."

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.